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    - \* Federation
    - \* Internal Storage Layer
    - \* Node Components
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    - \* RBAC
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    - \* Service
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    - \* Volumes
  - Notable Features
    - \* Autoscaling
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    - \* Federation
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    - \* kubeadm
    - \* Node Components
    - \* RBAC
    - \* Scheduling
    - \* Service Catalog
    - \* Volumes
  - Deprecations
    - \* Cluster Provisioning Scripts
    - \* kubeadm
    - \* Other Deprecations
  - Changes to API Resources
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    - \* Admission Control
    - \* Authentication
    - \* Authorization
    - \* Autoscaling
    - \* Certificates
    - \* ConfigMap
    - \* CronJob
    - \* DaemonSet

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    - Other Notable Changes
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  - \* kubectl
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    - Bug fixes
    - Other Notable Changes
  - \* Node Components
    - Bug fixes
  - \* kube-controller-manager
  - \* kube-dns
  - \* kube-proxy
  - \* Scheduler
  - \* Volume Plugins
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- rbd
    - vSphere
    - Other Notable Changes
  - Changes to Cluster Provisioning Scripts
    - \* AWS
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    - \* libvirt CoreOS
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    - \* OpenStack
    - \* Container Images
    - \* Other Notable Changes
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  - Changelog since v1.6.0-beta.4
    - \* Other notable changes
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  - Downloads for v1.6.0-beta.4
    - \* Client Binaries
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  - Changelog since v1.6.0-beta.3
    - \* Other notable changes
- v1.6.0-beta.3
  - Downloads for v1.6.0-beta.3
    - \* Client Binaries
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  - Changelog since v1.6.0-beta.2
    - \* Other notable changes
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  - Downloads for v1.6.0-beta.2
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    - \* Other notable changes
- v1.6.0-alpha.3
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    - \* Client Binaries
    - \* Server Binaries
  - Changelog since v1.6.0-alpha.2
    - \* Other notable changes
- v1.6.0-alpha.2
  - Downloads for v1.6.0-alpha.2
    - \* Client Binaries
    - \* Server Binaries
  - Changelog since v1.6.0-alpha.1
    - \* Other notable changes
- v1.6.0-alpha.1
  - Downloads for v1.6.0-alpha.1
    - \* Client Binaries
    - \* Server Binaries
  - Changelog since v1.5.0
    - \* Action Required
    - \* Other notable changes

## v1.6.13

Documentation & Examples

### Downloads for v1.6.13

filename	sha256 hash
kubernetes.tar.gz	effda17f63d149f1082e85cf5e5bc41b1f5f9bf64e082020c4455ce2e4525e2
kubernetes-src.tar.gz	0552eb170d276c8dc33a66629da9641fd333813c353a2e741593c9acf81d39f

### Client Binaries

filename	sha256 hash
kubernetes-client-darwin-386.tar.gz	91cf455f8271e781de76517d2ba31740f8d8a2c9a9f900a59bae8ff639b1f21
kubernetes-client-darwin-amd64.tar.gz	5e1aa9357eb027d4c4ab21ee1bbc54a3c9bf3a60265a168ab7a02ae32f1800
kubernetes-client-linux-386.tar.gz	a2fb4f6a68581ef5aaf4dc2e0d4bc10c432007f88c82c97e236e27b482fc77f
kubernetes-client-linux-amd64.tar.gz	d94f999c6a7bcda4e0901399d7613eba237c2f0632df9317a59d87097ba59c
kubernetes-client-linux-arm64.tar.gz	b80f2ecb7c6e5f3315b129a69efef7d01317fada4a739a6a890225d24c50a3
kubernetes-client-linux-arm.tar.gz	270396ec50d523706387d1270c717d1d3c00112c6e92399726620086643025f
kubernetes-client-linux-ppc64le.tar.gz	117d5d73529306c2b43e7db7692fa651d7a715c61ca31866af87aee8c81bd8e
kubernetes-client-linux-s390x.tar.gz	48e812aa64e484f10a5083c2198b48b75d203489084271a259ba55b6138f616
kubernetes-client-windows-386.tar.gz	e3425bf16e66250f6cb358efb908b4922d82258772259829ac6fb43a6e8c5f5
kubernetes-client-windows-amd64.tar.gz	04514ad6957011da3e26e5bcf23ffad4078a42a0286dfd66da8a46aee3132a

### Server Binaries

filename	sha256 hash
kubernetes-server-linux-amd64.tar.gz	08854f22684fe3dcf00c90ed841ab0c40566175a7611fc6111943da0beb8aee
kubernetes-server-linux-arm64.tar.gz	01cae48b032fab674aad7c350c8e04b4f5bcc77f98601817cb9177843bb24f4
kubernetes-server-linux-arm.tar.gz	e0ce0f75442e48ea495c36071818345c9302204f933acb86c8ad357da8924fa
kubernetes-server-linux-ppc64le.tar.gz	5bba326c1a95030ba559627589107875932ef9d41610888a4ee89785f022f9b
kubernetes-server-linux-s390x.tar.gz	8e21336a027ad71c382d2d0ecac777b32441b90dad948b67a49078288646037

### Node Binaries

filename	sha256 hash
kubernetes-node-linux-amd64.tar.gz	c2062b4d2c00db35b5d159651d50fbdc826fc4f866d4add483650da58b4cdfa

filename	sha256 hash
kubernetes-node-linux-arm64.tar.gz	9b865d9be4ecde441ed959e240b4e7df1718e1fd38861084ae6f4b14e3b2f8b
kubernetes-node-linux-arm.tar.gz	9d0433621021bca490e8a04eb96e47402d3f8e3d47762590b83be6a595d29b1
kubernetes-node-linux-ppc64le.tar.gz	438f0e05d29e371c028e73b28c31e3b13dc1dec0780557e0231d96de871b41
kubernetes-node-linux-s390x.tar.gz	aabf03fd85b75d57cc27548e74585e3926383a82b3f8201800b34ca483d31b0
kubernetes-node-windows-amd64.tar.gz	b02148bfdc9c0937841cced51a436afcc81a70d10be2edcf3b55f045e4ee3b2

## Changelog since v1.6.12

### Other notable changes

- Bump cAdvisor to v0.25.1, which adds support for the Docker overlay2 storage driver. (#55744, @dashpole)
- GCE: provide an option to disable docker's live-restore on COS/ubuntu (#55260, @yujuhong)
- Fix kube-proxy hang due to panic when requesting a closed healthcheck. (#46450, @MrHohn)
- Fix Flexvolume/FC/ISCSI volumes not being mounted after Node reboot. (#51985, @chakri-nelluri)

## v1.6.12

Documentation & Examples

### Downloads for v1.6.12

filename	sha256 hash
kubernetes.tar.gz	d57a05942f581959bc31778def4df4b526df80adaa75942214e9439fdecbe74
kubernetes-src.tar.gz	c1781161d1b0fa0c8dbd3a644ee42e65968a0a4bb5bec47f2c70796edbc1d39

### Client Binaries

filename	sha256 hash
kubernetes-client-darwin-386.tar.gz	85956c72c8fc1a1c4768e95fb403ddb1740db1f2d6dec8263d74a67cfce429b
kubernetes-client-darwin-amd64.tar.gz	bcea37dc2852ee83bdcac505600e724ae391e3a5879232d47ddd763cb2253c1



filename	sha256 hash
kubernetes-client-linux-386.tar.gz	8e0f3d0a6807b050070717efacd25db9f96ad3f0ef59d9095aae71ab2073423
kubernetes-client-linux-amd64.tar.gz	5f324e91dce59e05acdc0d6c0a8a6a56d5a5d1a3144e58b6de5c22a9b9020f8
kubernetes-client-linux-arm64.tar.gz	442fadf05af70826231e03b0146c0f9283ec474d6a1ba390eac7204888db5d
kubernetes-client-linux-arm.tar.gz	2e8073e626ba6a6f6148ccca3d5bbfd20f051f9992de676446d2ae259555a75
kubernetes-client-linux-ppc64le.tar.gz	f6af1ea1762e9fe889e10da670f61ce0bd2c1bc8fd5c1bd9fc3d1eacabe820a
kubernetes-client-linux-s390x.tar.gz	77aee845c290b5637d2560586e9065220aa433d6e15be03c6bbb6dfc7529256
kubernetes-client-windows-386.tar.gz	6a47f85d4e01595bb7e58469a4cab09053e5e11819440c630ae47008aa0b000
kubernetes-client-windows-amd64.tar.gz	6b4f1ae4bed0523a0c5b2b1d6dc9cb1ac54399a2a78b548acd876b8029a2dd6

### Server Binaries

filename	sha256 hash
kubernetes-server-linux-amd64.tar.gz	0970f6da85acd1bb61e92a77c7dbfa3f059da409db68c3d940781708795a020
kubernetes-server-linux-arm64.tar.gz	d598d846882744e724e65156807a3b2fa5bb92e1c389ff2e08984455346a730
kubernetes-server-linux-arm.tar.gz	6c02ade45ba8495917f0a7fe0542369ba482bc98f2dc008f7f69a21fd2e653c
kubernetes-server-linux-ppc64le.tar.gz	5479030e4ff21afcd638f4dd22bd0f6fb221dc3b27731954c0a5e53877ed113
kubernetes-server-linux-s390x.tar.gz	6407d6c580acc2fafbe2d87b309e60c6d16624403308e41a8a973d772bf26e3

### Node Binaries

filename	sha256 hash
kubernetes-node-linux-amd64.tar.gz	9cb5a28417cbc34165eaa2eb412488738b0e190e9128bb68b16d68d2a942b4c
kubernetes-node-linux-arm64.tar.gz	e4c1d1994b7595f2ac9c7ffebaaefc0737c1fbbcc4d2a9a9097d52d060236ac
kubernetes-node-linux-arm.tar.gz	77879441f3b5e753959b32103ef6a49fbc9ccea16cac1b1fb83446b5d573901

filename	sha256 hash
kubernetes-node-linux-ppc64le.tar.gz	c6866605adf86d5bc91acb670c5d8bba00c989a8758014a17322c041289e472
kubernetes-node-linux-s390x.tar.gz	8a280b31c7118728660ac4b7010ed0af9bc3b058e98964c04b47f58c5fd8467
kubernetes-node-windows-amd64.tar.gz	bc3d39ed8f23e59692bcffc23eaae7f575bef01e3c7c1510528662f984283a

## Changelog since v1.6.11

### Other notable changes

- Azure cloudprovider: Fix controller manager crash issue on a manually created k8s cluster. (#53694, @andyzhangx)
- Fix kubelet reset liveness probe failure count across pod restart boundaries. (#46371, @sjenning)

## v1.6.11

Documentation & Examples

### Downloads for v1.6.11

filename	sha256 hash
kubernetes.tar.gz	0dacad1c3da0397b6234e474979c4095844733315a853feba5690dbdf8db15a
kubernetes-src.tar.gz	818fdcf41d7b6d90b9dc37ca12c2fbeb1b6fb20f998ee04fddce4a9bb861035

### Client Binaries

filename	sha256 hash
kubernetes-client-darwin-386.tar.gz	c9a24250d68ddde25a09955c5f944812a9aeb5e0f3fd61313dbd166348aa59
kubernetes-client-darwin-amd64.tar.gz	f51e83ff2e026856cae7e365b17c20d94fe59d4a2749daa7bc4dbfb184f14a3
kubernetes-client-linux-386.tar.gz	16afc423b6f68cc5b24c322ee383e3f7c0fc5c3c98dd4cc90f93cfbd820964
kubernetes-client-linux-amd64.tar.gz	fca4eaae3bd6b9482ec130146b5ee24159effd66ea70d3c4ce174a45c770fcc
kubernetes-client-linux-arm64.tar.gz	6d7d777357c1920b2ef4060f7f55de7c92655c99aa7caf71fbb6311ddbba457
kubernetes-client-linux-arm.tar.gz	15bbfadbd4ce4b46d1473cb662396f1ac0372c9134ebd597de91565b59ddb20

filename	sha256 hash
kubernetes-client-linux-ppc64le.tar.gz	961a942875daf30aad3fdebd3796eb6311f46eb31fe8558ffde086c5424a1c2
kubernetes-client-linux-s390x.tar.gz	3874548181ac06feb280f1cf6f7ae851599f68d0abc96d3af17264889ff9d99
kubernetes-client-windows-386.tar.gz	7c305dd4d00e877843efa187948c93907d440cf3fccccd31cc18e243c319eec7
kubernetes-client-windows-amd64.tar.gz	ee27b50a82d845d4e2ddecba401f36e1e47dd0fb8f67c60465e99e8947b74014

### Server Binaries

filename	sha256 hash
kubernetes-server-linux-amd64.tar.gz	daea028d6777597aaee33ea7c9e3f1210b46ce895faac9ca85c7b1553923ce8
kubernetes-server-linux-arm64.tar.gz	1f098c7bc06aeb7d532d270538f3aa3a029e3f6460b26e9449b361ed7de9370
kubernetes-server-linux-arm.tar.gz	c5d6ae53fa95eb0e3b02e046e99144b8604dba7a16f373a2a02ae2fa88818ee
kubernetes-server-linux-ppc64le.tar.gz	06bba3736754cc7650b45c6a832b14d0539e63c5cec59f8ecd763803ea4397b
kubernetes-server-linux-s390x.tar.gz	632fb6bb0a1144d91b1f559967731223a2bf53423539317e015dcf73aef6cb5

### Node Binaries

filename	sha256 hash
kubernetes-node-linux-amd64.tar.gz	c8a38711db9625dd4b1e55923961c22276a0a07c976d371dd91b638b6d0a675
kubernetes-node-linux-arm64.tar.gz	9bd3c3cf6e98e882b397708f3fab0fd5f4476e97bd3a897598a7ded822bd531
kubernetes-node-linux-arm.tar.gz	563d22c94513d287e4f01dbc40b2f300dbdf9c9dbaf8394bf18c2604796dce5
kubernetes-node-linux-ppc64le.tar.gz	4d249236a64414ad5b201c994ae867458a49a4dea53c4c7eb5ba1d0af07433c
kubernetes-node-linux-s390x.tar.gz	35c2132ef07dedc4d64d72fc194aa0824d427a3780733508493d9d87538ced0
kubernetes-node-windows-amd64.tar.gz	b4279e7e38d1777354b557e17419ec3ab8399addb0e535669d485fb9416fb76

## Changelog since v1.6.10

### Other notable changes

- Update kube-dns to 1.14.5 (#53112, @bowei)
- Fix panic in ControllerManager on GCE when it has a problem with creating external loadbalancer healthcheck (#52646, @gmarek)
- When performing a GET then PUT, the kube-apiserver must write the canonical representation of the object to etcd if the current value does not match. That allows external agents to migrate content in etcd from one API version to another, across different storage types, or across varying encryption levels. This fixes a bug introduced in 1.5 where we unintentionally stopped writing the newest data. (#48394, @smarterclayton)
- StatefulSet will now fill the `hostname` and `subdomain` fields if they're empty on existing Pods it owns. This allows it to self-correct the issue where StatefulSet Pod DNS entries disappear after upgrading to v1.7.x (#48327). (#51199, @kow3ns)
- Make logdump support kubemark and support gke with 'use\_custom\_instance\_list' (#51834, @shyamjvs)
- Fix credentials providers for docker sandbox image. (#51870, @feiskyer)

## v1.6.10

Documentation & Examples

### Downloads for v1.6.10

filename	sha256 hash
kubernetes.tar.gz	8877359b78950b12a48ea68483f4e4ba2d2521f7e8620efca6f84275cb02342
kubernetes-src.tar.gz	560d1441b72c670c3d21f838f8d0a94bc75628b1bdd322b18e91df2578a0f8a

### Client Binaries

filename	sha256 hash
kubernetes-client-darwin-386.tar.gz	087799af2856decf438dbd896260cfdec3c02c6a42e2e2f90b608f21d61a8f1
kubernetes-client-darwin-amd64.tar.gz	8d9dbbee46a26fcf7f50af145b888881a428d62a3ee929b75e0a6833553de4a
kubernetes-client-linux-386.tar.gz	d69bd343613bd3f57799d05de5f56ec159ddb6f38cbec1d914b5c2e7a2945f6
kubernetes-client-linux-amd64.tar.gz	b0e2420e66257e67c9f53c996feebff20bebbbe5c9bc12b85b973a165ee436e
kubernetes-client-linux-arm64.tar.gz	4d9b6064fd409789c7bc07b7a3746798f94a19bf811021f727fcf8afdbd432a

filename	sha256 hash
kubernetes-client-linux-arm.tar.gz	7a02002aa3c4f6c5c2ff662fe023da3cd32a687967bb42a76e2014fe12a349f
kubernetes-client-linux-ppc64le.tar.gz	f0b26ad0bdf578a8c98e870a276ad7b8d77ef13f423476b21b78f18077b838
kubernetes-client-linux-s390x.tar.gz	da4125aff73b1d397b2917d4397690686d44f426471fd12eed080947c0de03e
kubernetes-client-windows-386.tar.gz	0bd8aeb66a1d5235da85a71150e10838c0d8d67ecb8b368262d52ac86ff10d1
kubernetes-client-windows-amd64.tar.gz	3a89271b4554e56c37038f797ad31f357107257d80fed9ab5ca80832e33cf00

### Server Binaries

filename	sha256 hash
kubernetes-server-linux-amd64.tar.gz	ae897c9db3a0b89be6ff66ca8e35b41165be620614f60aab424d76deffa45b0
kubernetes-server-linux-arm64.tar.gz	f6ce8a89f2ce9b380789828ba2723ac834d2dd40dd20403f22040ee08a390b0
kubernetes-server-linux-arm.tar.gz	085a3166785ab4fe17cc153fa6306df55af6fa90d5a3a4670923cf4515323f7
kubernetes-server-linux-ppc64le.tar.gz	c55f6741370471a2caac8b844865d908c8b327f2aea6685e193d54f4b14a5a6
kubernetes-server-linux-s390x.tar.gz	e36bd6f3bd7493f4ba12ceeebc9a6102778d20d203054d74cd69e929b7abcc8

### Node Binaries

filename	sha256 hash
kubernetes-node-linux-amd64.tar.gz	e083f7bc8028a2eb03bbcc6be93a95377e74906ae49970af034d36b3409f72c
kubernetes-node-linux-arm64.tar.gz	95895aab99979aca8cb713f53b2be0f11b16c3a76e97c206a70969a3cc3e003
kubernetes-node-linux-arm.tar.gz	a1e2dee888f4ef9affd1c2b747602f4d53971911b93ea69174d7301a5f7e1cc
kubernetes-node-linux-ppc64le.tar.gz	1cbaa1f6116c862acaef7a3e1ad6c27bcf5f87eb4ce01f6f9164c58caa2e000
kubernetes-node-linux-s390x.tar.gz	178a53d8193464a6062b3ebdea6c8dbb3dcb9f7c0ab1f40e386e555939c0be5
kubernetes-node-windows-amd64.tar.gz	1c044217184bcbe7e11c9fe0c511bbc6353935fc850b2c6b0f6ca0f2cbe31a8

## Changelog since v1.6.9

### Other notable changes

- Add `--request-timeout` to `kube-apiserver` to make global request timeout configurable. (#51415, @jpbetz)
- Fix for Nodes in vSphere lacking an InternalIP. (#48760) (#49202, @cbonte)
- GCE: Bump GLBC version to 0.9.6. (#50096, @nicksardo)
- In GCE with COS, increase `TasksMax` for Docker service to raise cap on number of threads/processes used by containers. (#51986, @yujuhong)
- Fixed an issue (#47800) where `kubect1 logs -f` failed with `unexpected stream type ""`. (#51872, @feiskyer)
- Fix for Pod stuck in `ContainerCreating` with error “Volume is not yet attached according to node”. (#50806, @verult)
- Fix initial exec terminal dimensions. (#51126, @chen-anders)
- vSphere: Fix attach volume failing on the first try. (#51218, @BaluDontu)

## v1.6.9

Documentation & Examples

### Downloads for v1.6.9

filename	sha256 hash
kubernetes.tar.gz	08be94c252e7fbbdd7c14811ec021818e687c1259e557b70db10aac64c0e8e4b
kubernetes-src.tar.gz	519501e26afc341b236c5b46602f010a33fc190e3d1bfb7802969b2e979faae

### Client Binaries

filename	sha256 hash
kubernetes-client-darwin-386.tar.gz	864f2307dd22c055063d1a55354596754a94d03f023e7278c24d5978bba00b3
kubernetes-client-darwin-amd64.tar.gz	0a107e0a1d7e6865ddd9241f1e8357405f476889a6f1a16989ba01f6cffd3be
kubernetes-client-linux-386.tar.gz	b20599e266248e7e176383e0318acd855c1aad8014396cc4018adde11a33d0c
kubernetes-client-linux-amd64.tar.gz	0690a8c9858f91cc000b3acd602799bf2320756b7471e463df2e3a36fbdde88
kubernetes-client-linux-arm64.tar.gz	354897ffc6382b8eb27f434d8e7aa3cbfae4b819da3160a43db8ccb8cae1275
kubernetes-client-linux-arm.tar.gz	6897408bf8d65d1281555c21ae978a4ccd69482a7ad2549bcec381416e312d7

filename	sha256 hash
kubernetes-client-linux-ppc64le.tar.gz	2afae0c211eb415829446f90a0bf9d48b9f8311ac4566fa74a08415ed9a31e7
kubernetes-client-linux-s390x.tar.gz	abde354528cc9c8ced49bb767ffcd8bfae47a0b4b5501502f560cf663a0c4a0
kubernetes-client-windows-386.tar.gz	83083c0d78e9468c7be395282a4697d2c703d3310593e7b70cd09fa9e7791d8
kubernetes-client-windows-amd64.tar.gz	3471db3463d60d22d82edb34fbe3ca301cc583ebddffc2664569255302e7d30

### Server Binaries

filename	sha256 hash
kubernetes-server-linux-amd64.tar.gz	598e49c8a22e4e8db1e1c0ed9d8955c991425cd4e06c072ac36fd5ed693b1c6
kubernetes-server-linux-arm64.tar.gz	5ce75f57636d537b4bf3ca00c4a1322e9c1aaf273bd945304333b558af3c083
kubernetes-server-linux-arm.tar.gz	afea9780049c5e6548f64973bd8679aae60672ab05027f8c36784ccf2a83a1b
kubernetes-server-linux-ppc64le.tar.gz	cd131b3e39e4160cd9920fe2635b4f6da4679cce12cb2483cfe28197e366bce
kubernetes-server-linux-s390x.tar.gz	93ee43f33cbe061ac088acf62099be1abd0d9c0b4a8a79be4069904c3780c76

### Node Binaries

filename	sha256 hash
kubernetes-node-linux-amd64.tar.gz	f8f13233b168c4833af685817f9591c73658d1377ceb9d550cbea929c6e27c2
kubernetes-node-linux-arm64.tar.gz	1ed434f9e6469c8cc7a3bb15404e918cf242ef92ef075e7cf479b7e951269b5
kubernetes-node-linux-arm.tar.gz	3fd8e089184f83bd9ed2cf5f193253e1f7b9b853876a08a2babf91647d6d0a0
kubernetes-node-linux-ppc64le.tar.gz	9673547a32f83498bb28f02212d419b28cc50a0a4d7b866396994b5ea9313e7
kubernetes-node-linux-s390x.tar.gz	80044cdeb4260e807660c166ed15bb2a9db03d59d8c186b1d4f9a53841cea32
kubernetes-node-windows-amd64.tar.gz	b1dd678ee2974dc83ea7cfe8516557c9360ed55e40cad1b68803b71786f8d16

## Changelog since v1.6.8

### Other notable changes

- StatefulSet: Set hostname/subdomain fields on new Pods in addition to the deprecated annotations, to allow mitigation of Pod DNS issues upon upgrading to Kubernetes v1.7.x. (#50942, @enisoc)
- Azure: Allow VNet to be in a separate Resource Group. (#49725, @sylr)
- In GCE, add measures to prevent corruption of known\_tokens.csv. (#49897, @mikedanese)
- Fixed a bug in the API server watch cache, which could cause a missing watch event immediately after cache initialization. (#49992, @liggitt)

## v1.6.8

Documentation & Examples

### Downloads for v1.6.8

filename	sha256 hash
kubernetes.tar.gz	c87f7826f0b7cf91baddd97ebafb33e99d91dcf6b9019a50bee0689527541e1
kubernetes-src.tar.gz	591c43f9624dac351745da35444302cd694ad4953275b8f09016b4654d37b79

### Client Binaries

filename	sha256 hash
kubernetes-client-darwin-386.tar.gz	3f6cda6ca2cf3e8f038649f1021ca23c35f4da12d66cefaa4339c9613ca9bb
kubernetes-client-darwin-amd64.tar.gz	147bf5124e44a1557b95e7daa76717992b7890e79910c446dc682103f62325e
kubernetes-client-linux-386.tar.gz	cd7238c19f9d4a4ce0b14c2d954f6ead2235caa2d74b319524a0d2ffeea0ca3
kubernetes-client-linux-amd64.tar.gz	34042be9607ca75702384552b31514f594af22d3c1d88549b0cd4ce36ee8fd
kubernetes-client-linux-arm64.tar.gz	3a7d4be76dda07fac50a257275369b3f4c48848e2963b55b46fa9df44477bf
kubernetes-client-linux-arm.tar.gz	0a060b8745b3c0e8173827af3d91a4748eb191a9c15538625eee108f6024fc1
kubernetes-client-linux-ppc64le.tar.gz	bbc7be082d20082179de5efb85c0da9d0f3811c2119d3928bf89edc8f59e8cc
kubernetes-client-linux-s390x.tar.gz	5e93d7ed4797f6b8742925d13f791e862bdb410bdd2b33737882132aabcc0b1
kubernetes-client-windows-386.tar.gz	22a0a80fa5ed5f0745371cc9fd68eeeb0671242cf7c476fb4e635ccd9ef8c2b



filename	sha256 hash
kubernetes-client-windows-amd64.tar.gz	ce42d7e826aa07bd98a424332926b04e75effbe926b098565781de3c3b6d24

### Server Binaries

filename	sha256 hash
kubernetes-server-linux-amd64.tar.gz	9bf31375917ffdf9a9437ed562e96a1e2b43e23dcb4a42204032bb289ff12b6
kubernetes-server-linux-arm64.tar.gz	51d84e7b1ace983b13639f1fe4bf1b11212d178e6a75b769de9bdac97d1fa7a
kubernetes-server-linux-arm.tar.gz	b704de70774c6c0feb13a7b47d8d757e9a0438406b7fd1d33d0c5cb991d179b
kubernetes-server-linux-ppc64le.tar.gz	f36f086481656fcb659a456ca832d62274e40defc1a3ed1dcc1e5ea7a696729
kubernetes-server-linux-s390x.tar.gz	348f8a733556fcceaaa27d316c3e2ea01039c860988a434d7c9a850bc241254

### Node Binaries

filename	sha256 hash
kubernetes-node-linux-amd64.tar.gz	e38255961c73e021bcca08890918f23cce39831536bf74496aa369049a1eb16
kubernetes-node-linux-arm64.tar.gz	be06c10320f3f996a48845eef9572353f9a0bd56330338c4cad6aca1fcc4fa
kubernetes-node-linux-arm.tar.gz	06c6ecd885fbb4889791e78f50cdcb9920ee8f1e866d4fa921bc2096dbfbbd4
kubernetes-node-linux-ppc64le.tar.gz	74e88435549cc46f3fc082300bf373c7d824921bd01eabf789a1b09e1a17a04
kubernetes-node-linux-s390x.tar.gz	7ebe22e74653650ac0cedbfc482f5ff08713c40747018dac7506b36bb78ee81
kubernetes-node-windows-amd64.tar.gz	66b66655976647f50db3eda61849cbb26bcb06ad20a866328f24aef862758b1

## Changelog since v1.6.7

### Other notable changes

- Revert deprecation of vCenter port in vSphere Cloud Provider. (#49689, @divyenpatel)
- kubeadm: Add preflight check for localhost resolution. (#48875, @craig-tracey)

- Fix panic when using `kubeadm init` with vsphere cloud-provider. (#44661, @xiangpengzhao)
- kubectl: Fix bug that showed terminated/evicted pods even without `--show-all`. (#48786, @janetkuo)
- Never prevent deletion of resources as part of namespace lifecycle (#48733, @liggitt)
- AWS cloudprovider plugin: Fix for large clusters (200+ nodes). Also fix bug with volumes not getting detached from a node after reboot. (#48312, @gnufied)
- Fix Pods using Portworx volumes getting stuck in ContainerCreating phase. (#48898, @harsh-px)
- RBAC role and role-binding reconciliation now ensures namespaces exist when reconciling on startup. (#48480, @liggitt)

## v1.6.7

Documentation & Examples

### Downloads for v1.6.7

filename	sha256 hash
kubernetes.tar.gz	6522086d9666543ed4e88a791626953acd1ea843eb024f16f4a4a2390dcbb2b
kubernetes-src.tar.gz	b2a73f140966ba0080ce16e3b9a67d5fd9849b36942f3490e9f8daa0fe4511c

### Client Binaries

filename	sha256 hash
kubernetes-client-darwin-386.tar.gz	ffa06a16a3091b2697ef14f8e28bb08000455bd9b719cf0f510f011b864cd1e
kubernetes-client-darwin-amd64.tar.gz	32de3e38f7a60c9171a63f43a2c7f0b2d8f8ba55d51468d8dbf7847dbd943b4
kubernetes-client-linux-386.tar.gz	d9c27321007607cc5afb2ff5b3cac210471d55dd1c3a478c6703ab72d18721
kubernetes-client-linux-amd64.tar.gz	54947ef84181e89f9dbacedd54717cbed5cc7f9c36cb37bc8afc9097648e2c5
kubernetes-client-linux-arm64.tar.gz	e96d300eb6526705b1c1bedaaaf3f4746f3e5d6b49ccc7e60650eb9ee022fba
kubernetes-client-linux-arm.tar.gz	e4605dca3948264fba603dc8f95b202528eb8ad4ca99c7f3a61f77031e7ba75
kubernetes-client-linux-ppc64le.tar.gz	8b77793aea5abf1c17b73f7e11476b9d387f3dc89e5d8405ffadd1a3952584
kubernetes-client-linux-s390x.tar.gz	ff3ddec930a0ffdc83fe324d544d4657d57a64a3973fb9df4ddaa7a98228d7f

filename	sha256 hash
kubernetes-client-windows-386.tar.gz	ce09e4b071bb06039ad9bdf6a1059d59cf129dce942600fcdc9d320ff0c07a7
kubernetes-client-windows-amd64.tar.gz	e985644f582945274e82764742f02bd175f05128c1945e987d06973dd5f5a5

## Server Binaries

filename	sha256 hash
kubernetes-server-linux-amd64.tar.gz	1287bb85f1057eae53f8bb4e4475c990783e43d2f57ea1c551fdf2da7ca534
kubernetes-server-linux-arm64.tar.gz	51623850475669be59f6428922ba316d4dd60d977f892adfaf0ca0845c3850
kubernetes-server-linux-arm.tar.gz	a5331022d29f085e6b7fc4ae064af64024eba6a02ae54e78c2e84b40d0aec5
kubernetes-server-linux-ppc64le.tar.gz	93d52e84d0fea5bdf3ede6784b8da6c501e0430c74430da3a125bd45c557e1
kubernetes-server-linux-s390x.tar.gz	baccbb6fc497f433c2bd93146c31fbca1da427e0d6ac8483df26dd42ccb79c

## Node Binaries

filename	sha256 hash
kubernetes-node-linux-amd64.tar.gz	0cfdd51de879869e7ef40a17dfa1a303a596833fb567c3b7e4f82ba0cf8638
kubernetes-node-linux-arm64.tar.gz	d07ef669d94ea20a4a9e3a38868ac389dab4d3f2bdf8b27280724fe63f4de3
kubernetes-node-linux-arm.tar.gz	1cc9b6a8aee4e59967421cbded21c0a20f02c39288781f504e55ad6ca71d10
kubernetes-node-linux-ppc64le.tar.gz	3f412096d8b249d671f924c3ee4aecf3656186fde4509ce9f560f67a9a166b
kubernetes-node-linux-s390x.tar.gz	2cca7629c1236b3435e6e31498c1f8216d7cca4236d8ad0ae10c83a422519a
kubernetes-node-windows-amd64.tar.gz	4f859fba52c044a9ce703528760967e1efa47a359603b5466c0dc0748eb25e

## Changelog since v1.6.6

### Other notable changes

- kubeadm: Expose only the cluster-info ConfigMap in the kube-public ns (#48050, @luxas)

- Fix kubelet request timeout when stopping a container. (#46267, @Random-Liu)
- Add generic NoSchedule toleration to fluentd in gcp config. (#48182, @gmarek)
- Update cluster-proportional-autoscaler, fluentd-gcp, and kube-addon-manager, and kube-dns addons with refreshed base images containing fixes for CVE-2016-9841, CVE-2016-9843, CVE-2017-2616, and CVE-2017-6512. (#47454, @ixdy)
- Fix fluentd-gcp configuration to facilitate JSON parsing (#48139, @cras-sirostris)
- Bump runc to v1.0.0-rc2-49-gd223e2a - fixes **failed to initialise top level QOS containers** kubelet error. (#48117, @sjenning)
- **kubefed init** correctly checks for RBAC API enablement. (#48077, @liggitt)
- **kubectl api-versions** now always fetches information about enabled API groups and versions instead of using the local cache. (#48016, @liggitt)
- Fix kubelet event recording for selected events. (#46246, @derekwaynecarr)
- Fix **Invalid value: "foregroundDeletion"** error when attempting to delete a resource. (#46500, @tnozicka)

## v1.6.6

Documentation & Examples

### Downloads for v1.6.6

filename	sha256 hash
kubernetes.tar.gz	1574d868d43f5d88cfd1af255226e8cd6da72cd65fb9e1285557279c34f8a69
kubernetes-src.tar.gz	305f372320f78855e298b6caea062c8d1f7db117c7b44943ff5ddd016942403

### Client Binaries

filename	sha256 hash
kubernetes-client-darwin-386.tar.gz	d93ca6f95cd80856b04d9c76a98ca986d6ba183d9fa100619fcda9f157bfd7f
kubernetes-client-darwin-amd64.tar.gz	facda65133f2893296f64c1067807dd7b354e2a4440afdd1ee62c05c07bcb99
kubernetes-client-linux-386.tar.gz	5d1bd3ecc96f9e1cb9f20cef88c5aa2ec9c09370e8892557fc8a7cfe3cba599
kubernetes-client-linux-amd64.tar.gz	94b2c9cd29981a8e150c187193bab0d8c0b6e906260f837367feff99860a637
kubernetes-client-linux-arm64.tar.gz	a7554e496403b50c12f5dbfaa00f2b887773905894ae5c330e2accd7b7e1370

filename	sha256 hash
kubernetes-client-linux-arm.tar.gz	5a3414f4b47c84b173c879379d90b447af0540730bb86f10baf6d6933b09d41
kubernetes-client-linux-ppc64le.tar.gz	904bab541dd8f1236d5e47f97cd2509c649f629fdc3af88a3968ca3c5575880
kubernetes-client-linux-s390x.tar.gz	d4a85694f796e4e1c14e6bddc295d9f776001fd8ac92ed32565606b964a843b
kubernetes-client-windows-386.tar.gz	47258f6fc7fbd17ac1ddb38387adc5a2ddc2e39c5792cf3d354f9b19d373a6b
kubernetes-client-windows-amd64.tar.gz	e8c2957688acf19463e28d39cc1b4b1e9a12b3f10101dff179d1d63754b3423

### Server Binaries

filename	sha256 hash
kubernetes-server-linux-amd64.tar.gz	7bbf43f81f5dbc3729c1956705d95c218b848591d03789d48f10e58fa865a0b
kubernetes-server-linux-arm64.tar.gz	f725f491a8998bdf164470029441135336ec0414360d6b57a5d8daf73d09334
kubernetes-server-linux-arm.tar.gz	9026ca6fdbffef1d02409a86649e4dd0a7667ff6c27df318a3d851c271fb380
kubernetes-server-linux-ppc64le.tar.gz	cd3b1b693b4e8225f78751bff533024785b0e20c2c51228956692db2a21d9f6
kubernetes-server-linux-s390x.tar.gz	9cd42506f4891be4691b7f4a8be7b894109dca54d0e9130651bc869101d7ed1

### Node Binaries

filename	sha256 hash
kubernetes-node-linux-amd64.tar.gz	962f327f9a7b038c3b125a6cd06b690012fa38c827de0dae75955bb2be71712
kubernetes-node-linux-arm64.tar.gz	e09af9f1130f8e1d4f6b45ec79eedb94e98354edb813b635c0dc097437834a1
kubernetes-node-linux-arm.tar.gz	7647ec0a51308ca73e4c4eb4cbe09f2f9609c809e530d129a718d960a25d339
kubernetes-node-linux-ppc64le.tar.gz	439b2135b179b699ca951a2d619629583d92dbdfb60b3920a1fa872b4cd65b0
kubernetes-node-linux-s390x.tar.gz	eed95c80bddad4a67d81c036b0d047dfb7bef8fb13a4e1b4817c1f2a595b993
kubernetes-node-windows-amd64.tar.gz	611a92f9ab4f6dd48349843eec844b6abf861d76a151cce91b216a56bb6c823

## Changelog since v1.6.5

### Action Required

- Azure: Change container permissions to private for provisioned volumes. If you have existing Azure volumes that were created by Kubernetes v1.6.0-v1.6.5, you should change the permissions on them manually. (#47605, @brendandburns)

### Other notable changes

- Bump GLBC version to 0.9.5 - fixes loss of manually modified GCLB health check settings upon upgrade from pre-1.6.4 to either 1.6.4 or 1.6.5. (#47567, @nicksardo)

## v1.6.5

Documentation & Examples

### Known Issues for v1.6.5

- If you use the GLBC Ingress Controller, upgrading an existing pre-v1.6.4 cluster to Kubernetes v1.6.5 will cause an unintentional overwrite of manual edits to GCP Health Checks managed by the GLBC Ingress Controller. This can cause the health checks to start failing, requiring you to reapply the manual edits.
  - This issue does not affect clusters that were already running Kubernetes v1.6.4 or higher.
  - This issue does not affect Health Checks that were left in the configuration originally set by the GLBC Ingress Controller.

### Downloads for v1.6.5

filename	sha256 hash
kubernetes.tar.gz	e497ddd9d0fb03a71babd6c7f879951ba8e2d791c9884613d60794f7df9a5a3
kubernetes-src.tar.gz	3971e41435f6e22914b603ea56bec72f78673fca9f5a5436a4beda7957dc24c

### Client Binaries

filename	sha256 hash
kubernetes-client-darwin-386.tar.gz	af2290d1c3c923a6f873736739e0fc381328d19eb726419a17f2ae51e3ac2b4
kubernetes-client-darwin-amd64.tar.gz	8a138c2487871807bc8461a5bb0867d75cf9da228ecb6acdc5d22c08b2ed107

filename	sha256 hash
kubernetes-client-linux-386.tar.gz	3f6867dd51e7838f58cf7e95174ef914d8d280ff275ac56cc8b285566ce3095
kubernetes-client-linux-amd64.tar.gz	8f38e71b1c68d69299af86ab4432297ae0d72cdee1d1e1c9975d77e448096c9
kubernetes-client-linux-arm64.tar.gz	1d01ae4423eb9794d09202ff4f24207c9d62b32a1b8f4906801a66fcd70b8fa
kubernetes-client-linux-arm.tar.gz	438a8b4388960fe48e87aa7e97954f1cf9f9cc5c957eee108c3cc8040786fd
kubernetes-client-linux-ppc64le.tar.gz	3b64d6ce09ffb65d3fe8c4101309c3b39fdab3643d89f91e89445c8e3279884
kubernetes-client-linux-s390x.tar.gz	f5fb3ddc6a6203ae68b0213624bbfa12b114a70a38e85151272273cbd8fd4fb
kubernetes-client-windows-386.tar.gz	6ddc9b300746eefdc5d71aae193dea171115dab9db00010d416728d3f2035f1
kubernetes-client-windows-amd64.tar.gz	95854266bf64b84b59d1e6a3ca0501cf3c85fbd0258cb540893d5771aca74ac

### Server Binaries

filename	sha256 hash
kubernetes-server-linux-amd64.tar.gz	68809d34d3429685eaafedf398f690bba1bcc1f793cd2d8193559b90492c68b
kubernetes-server-linux-arm64.tar.gz	96bf4da5cbaa8f7b0f8909276005e0766ca4fa30431396ba30b9e77be1abb7f
kubernetes-server-linux-arm.tar.gz	2f9c5275a6a2b5b10416a3e76f64e996851f486eb6b2dbe0f106b81bb63e63a
kubernetes-server-linux-ppc64le.tar.gz	f47bc83530dc7448879e7d11c2ba1613adc318fd6c1cbbba76e5d7181d850667
kubernetes-server-linux-s390x.tar.gz	ebbd82df12da7470299e9877185797def86b859a44e72486e7be995c01eae50

### Node Binaries

filename	sha256 hash
kubernetes-node-linux-amd64.tar.gz	f842694701f8966cdfceca5f8f9d2b49bc84baf7446b67f7bf23b7581c245cc
kubernetes-node-linux-arm64.tar.gz	4efc4c8d9df77ad66763ce5cc39650ea1ebd43dd4f789622c93b0aa872f7a18
kubernetes-node-linux-arm.tar.gz	6f4e2b764aec5c458e8bf28159190c0c725e20ab94cf9ced3279dc75caa3fe2

filename	sha256 hash
kubernetes-node-linux-ppc64le.tar.gz	ba0e8ea11050273dbdf7b6d179251a95021b85000523e539c4940312586fd71
kubernetes-node-linux-s390x.tar.gz	b6555e9a94a38e8bda502ec3eb951d4d854ebe8c44ba31320882a497703ab2b
kubernetes-node-windows-amd64.tar.gz	0eaf3789c93996a45c74b30cc8a4d7169a639b7cf3fcf589ec387a0cfd0782

## Changelog since v1.6.4

### Other notable changes

- Fix iSCSI iSER mounting. (#47281, @mtanino)
- Added exponential backoff to Azure cloudprovider (#46660, @jackfrancis)
- Update kube-dns to 1.14.2. (#45684, @bowei)
- Fix log spam due to unnecessary status update when node is deleted. (#45923, @verult)
- Poll all active pods periodically for volumes to fix out of order pod & node addition events. Fixes volumes not getting detached after controller restart. (#42033, @NickrenREN)
- iscsi storage plugin: Fix dangling session when using multiple target portal addresses. (#46239, @mtanino)
- The namespace API object no longer supports the deletecollection operation, which was previously allowed by mistake and did not respect expected namespace lifecycle semantics. (#47098, @liggitt)
- Azure: Fix support for multiple `loadBalancerSourceRanges`, and add support for UDP ports and the Service spec's `sessionAffinity`. (#45523, @colemickens)
- Fix the bug where container cannot run as root when `SecurityContext.RunAsNonRoot` is false. (#47009, @yujuhong)
- Remove broken `getvolumename` and pass PV or volume name to attach call (#46249, @chakri-nelluri)
- Portworx volume driver no longer has to run on the master. (#45518, @harsh-px)
- Upgrade golang version to 1.7.6 (#46405, @cblecker)
- kube-proxy handling of services with no endpoints now applies to both INPUT and OUTPUT chains, preventing socket leak. (#43972, @thockin)
- Fix kube-apiserver crash when patching TPR data (#44612, @nikhita)
- vSphere cloud provider: Report same Node IP as both internal and external. (#45201, @abrarshivani)
- Kubelet: Fix image garbage collector attempting to remove in-use images. (#46121, @Random-Liu)
- Add metrics exporter to the fluentd-gcp deployment (#45096, @cras-sirostris)
- Fix the bug where `StartedAt` time is not reported for exited containers.



(#45977, @yujuhong)

- Enable basic auth username rotation for GCI (#44590, @ihmccreery)
- vSphere cloud provider: Filter out IPV6 node addresses. (#45181, @BaluDontu)
- vSphere cloud provider: Fix volume detach on node failure. (#45569, @divyenpatel)
- Job controller: Retry with rate-limiting if a Pod create/delete operation fails. (#45870, @tacy)
- Ensure that autoscaling/v1 is the preferred version for API discovery when autoscaling/v2alpha1 is enabled. (#45741, @DirectXMan12)
- Add support for Azure internal load balancer. (#45690, @jdumars)
- Fix `kubectl delete --cascade=false` for resources that don't have legacy overrides to orphan by default. (#45713, @kargakis)
- Fix erroneous FailedSync and FailedMount events being periodically and indefinitely posted on Pods after kubelet is restarted (#44781, @wongma7)
- fluentd will tolerate all NoExecute Taints when run in gcp configuration. (#45715, @gmarek)
- Fix Deployments with Recreate strategy not waiting for Pod termination. (#45639, @ChipmunkV)
- vSphere cloud provider: Remove the dependency of login information on worker nodes for vsphere cloud provider. (#43545, @luomiao)
- vSphere cloud provider: Fix fetching of VM UUID on Ubuntu 16.04 and Fedora. (#45311, @divyenpatel)

## v1.6.4

Documentation & Examples

### Known Issues for v1.6.4

- If you use the GLBC Ingress Controller, upgrading an existing cluster to Kubernetes v1.6.4 will cause an unintentional overwrite of manual edits to GCP Health Checks managed by the GLBC Ingress Controller. This can cause the health checks to start failing, requiring you to reapply the manual edits.
  - This issue does not affect clusters that start out with Kubernetes v1.6.4 or higher.
  - This issue does not affect Health Checks that were left in the configuration originally set by the GLBC Ingress Controller.

### Downloads for v1.6.4

filename	sha256 hash
kubernetes.tar.gz	fef6a97be8195fee1108b40acbd7bea61ef5244b8be23e799d2d01ee365907c

filename	sha256 hash
kubernetes-src.tar.gz	2915465e9b389c5af0fa660f6e7cbc36a416d1286094201e2a2da5b084a37c1

### Client Binaries

filename	sha256 hash
kubernetes-client-darwin-386.tar.gz	e2db37a1cf3dff342e9ba25506c96edba0cbc9b65984dfe985a7ab45df64f93
kubernetes-client-darwin-amd64.tar.gz	0d49df4b06f76b5a6e168f72ac0088194d4267cc88880f7d0f23e558cd0ee3
kubernetes-client-linux-386.tar.gz	5e218cc7f01d6fa71d0a10a30eea2724ee111db3bbae5a03f0c560cd0d24a5c
kubernetes-client-linux-amd64.tar.gz	4c8dbd03a66d871f03592e84ed98d205d2d0e0c0f6d48c7b60f3e9840ad04d1
kubernetes-client-linux-arm64.tar.gz	9bf29b0f8bdde972d62556bdd14622199f979f7dcf56d3948d429b1d73fecad
kubernetes-client-linux-arm.tar.gz	bbca1efe8fb95c6df7b330054776ce619652ba9d4c5428eabef9c435c61d1d9
kubernetes-client-linux-ppc64le.tar.gz	7aa02e261f36a816dc1c7c898e16d732d9199d827ac4828f8e120b4a9ce5aa0
kubernetes-client-linux-s390x.tar.gz	531d00c43a49bb72365f2d6c1f31ad99ff09893e41f6b28d21980dbdd3ab0de
kubernetes-client-windows-386.tar.gz	256fa2ffa77a1107e87a5a232bf8aa245afbc5d383eda18f19f3fedbbad9a6
kubernetes-client-windows-amd64.tar.gz	c8a97087b81defdc513a9fe4aaf317d10ad6fc3368170465dd4ea64c2365593

### Server Binaries

filename	sha256 hash
kubernetes-server-linux-amd64.tar.gz	76a1d6dbce630b50fd3a5f566fcea6ef1a04996cf4f4c568338a3db0d3b6a3c
kubernetes-server-linux-arm64.tar.gz	8b731307138a71ae90e025cb85ec7b4ac9179ebd8923f7abd1c839a2966ff2b
kubernetes-server-linux-arm.tar.gz	0d3039f22cdc36526257f211c55099552b8d55cda25a05405f2701c869bb4be
kubernetes-server-linux-ppc64le.tar.gz	6de3a85392ff65c019fd90173f1219a41f56559aebd07b18ed497e46645fcf1
kubernetes-server-linux-s390x.tar.gz	622a137c06a9fda23ec5941dd41607564804eeede0e6d3976cda6cc136e010c

## Node Binaries

filename	sha256 hash
kubernetes-node-linux-amd64.tar.gz	df40c178ffbd92376e98dd258113e35c0a46a8313f188d34d391a834baeb1da
kubernetes-node-linux-arm64.tar.gz	a27b15a0edcfd78470db54181ea2c2c942b5d4489b6f7a4ba78bb1fac34f8fa
kubernetes-node-linux-arm.tar.gz	2b4dceee70ba7b508a0acc3cc5ce072d92f9c32c1a6961911b93a5da02ace9f
kubernetes-node-linux-ppc64le.tar.gz	c5e01f9f7de6ae2d73004bbcd288f5c942414b6639099c1bf52a98e59214774
kubernetes-node-linux-s390x.tar.gz	eded4d2b94c9c22ae6c865e32a7965c1228d564aebf90c533607c716ed89b67
kubernetes-node-windows-amd64.tar.gz	da561264f5665fe1ae9a41999731403b147b91c3a5c47439eb828ed688b0738

## Changelog since v1.6.3

### Other notable changes

- Fix kubelet panic during disk eviction introduced in 1.6.3. (#46049, @enisoc)
- Fix pods failing to start if they specify a file as a volume subPath to mount. (#46046, @enisoc)

## v1.6.3

Documentation & Examples

### Known Issues for v1.6.3

- This release introduced a regression when using subPath. If the `subPath` is a file rather than a directory, Pods may fail to start (#45613).

**Do not upgrade to v1.6.3** if your cluster may run Pods with such subPaths.

## Downloads for v1.6.3

filename	sha256 hash
kubernetes.tar.gz	0af5914fcea36b3c65c8185f31e94b2839eaed52dfdd666d31dfa14534a7d69
kubernetes-src.tar.gz	0d3cbc716b0d08bf3be779ddd096df965609b5bcb55c8b9ea084c6bb2d6ef11

## Client Binaries

filename	sha256 hash
kubernetes-client-darwin-386.tar.gz	2f2f58e8853eef7df293e579e8c94e1b6e75318b08bd1bf5747685ad8d16ebe
kubernetes-client-darwin-amd64.tar.gz	122c20e2e92c1ed4a592c8a3851867452acff181ffe5251e8fee0ec8284704a
kubernetes-client-linux-386.tar.gz	47c970bbe75a41634b9e5d0ae109a01f4823fdb83cf1c6c40a1ad4034b6d276
kubernetes-client-linux-amd64.tar.gz	ae141e0cd011889c4468b5b8b841d8cd62c1802c4ccba4dfd8c42beaccaf7e7
kubernetes-client-linux-arm64.tar.gz	07a83a7f7df555e859f4f8e143274f9ed1f475d597f01d1c79e95cdfda289c5
kubernetes-client-linux-arm.tar.gz	4a0b89b4985e651a1c29590ae2ea16ea00203d7cbad7ffc8a541b8a13569e1b
kubernetes-client-linux-ppc64le.tar.gz	1c0116942a61580da717845c9b7fc69aa58438aaa176888cd3e57267c9c717c
kubernetes-client-linux-s390x.tar.gz	94307d778e0819dc5a64e12d794e95a028207d06603204d82610f369e040ce
kubernetes-client-windows-386.tar.gz	322d2db5dadd4b388c785d1caf651bcc76c566afb6d19e84bdf6abcc40fa19c
kubernetes-client-windows-amd64.tar.gz	9ef35675f7cd6acb81fa69ded37174e9a55cc0f58a2f8159bfc551223049576

## Server Binaries

filename	sha256 hash
kubernetes-server-linux-amd64.tar.gz	22eadeff9c3a45bf4d490ffca50bd257b6c282a3d16b5b8b40b8c31070a94d
kubernetes-server-linux-arm64.tar.gz	2f9d976dd6d436a8258a5eb0c4a270329746f4331db607acc6b893f81f25e1c
kubernetes-server-linux-arm.tar.gz	11f6a859438805250b84b415427df5f07d44a2a2ffb37591b6cdc6c8dc31738
kubernetes-server-linux-ppc64le.tar.gz	670fc921b50cca1c4fc20fbe58be640eeae766d38f6b2053b68c1a1293e88ba
kubernetes-server-linux-s390x.tar.gz	c5f2358bf81ea34fc01dbe5b639f03a10b5799ad75f8465863bb5c2b797b4f0

## Node Binaries

filename	sha256 hash
kubernetes-node-linux-amd64.tar.gz	428332868f42f77e02f337779a18a6332894b27f2432c5b804a8ff753895b88
kubernetes-node-linux-arm64.tar.gz	a8bdefd9c0ba9a247536a5a1bb7481b7a937cf39951256be774e45b8e40250
kubernetes-node-linux-arm.tar.gz	6b5aa71b27c0524b714489de80b2100e66bef99112f452aeaedcde1f890d29
kubernetes-node-linux-ppc64le.tar.gz	34afa6e39ff8eb8a6f8f29874b6a3e5426fa6b64cc1b0f4466b17ae0f91f71a
kubernetes-node-linux-s390x.tar.gz	170953b40e70242249c31e32456de73dacbed54e537efa4275d273441df98f7
kubernetes-node-windows-amd64.tar.gz	410f175a47335b93f212cff5f3921a062ca6e945fa336d3cf0971f9bebbba73e

## Changelog since v1.6.2

### Other notable changes

- Bump GLBC version to 0.9.3 (#45055, @nicksardo)
- kubeadm: Fix invalid assign statement so it is possible to register the master kubelet with other initial Taints (#45376, @luxas)
- Fix a bug that caused invalid Tolerations to be applied to Pods created by DaemonSets. (#45349, @gmarek)
- Bump cluster autoscaler to v0.5.4, which fixes scale down issues with pods ignoring SIGTERM. (#45483, @mwielgus)
- Fixes and minor cleanups to pod (anti)affinity predicate (#45098, @wojtekt)
- StatefulSet: Fix to fully preserve restart and termination order when StatefulSet is rapidly scaled up and down. (#45113, @kow3ns)
- Fix some false negatives in detection of meaningful conflicts during strategic merge patch with maps and lists. (#43469, @enisoc)
- cluster-autoscaler: Fix duplicate writing of logs. (#45017, @MaciekPytel)
- Fixes a bug where pods were evicted even after images are successfully deleted. (#44986, @dashpole)
- CRI: respect container's stopping timeout. (#44998, @feiskyer)
- Fix problems with scaling up the cluster when unschedulable pods have some persistent volume claims. (#44860, @mwielgus)
- Exclude nodes labeled as master from LoadBalancer / NodePort; restores documented behaviour. (#44745, @justinsb)
- Fix for scaling down remaining good replicas when a failed Deployment is paused. (#44616, @kargakis)
- kubectl commands run inside a pod using a kubeconfig file now use the namespace specified in the kubeconfig file, instead of using the pod namespace. If no kubeconfig file is used, or the kubeconfig does not specify a namespace, the pod namespace is still used as a fallback. (#44570,

@liggitt)

- Restored the ability of kubectl running inside a pod to consume resource files specifying a different namespace than the one the pod is running in. (#44862, @liggitt)
- Fix false positive “meaningful conflict” detection for strategic merge patch with integer values. (#44788, @enisoc)
- Fix insufficient permissions to read/write volumes when mounting them with a subPath. (#43775, @wongma7)
- vSphere cloud provider: Allow specifying fstype in storage class. (#41929, @abrarshivani)
- vSphere cloud provider: Allow specifying VSAN Storage Capabilities during dynamic volume provisioning. (#42974, @BaluDontu)

## v1.6.2

Documentation & Examples

### Downloads for v1.6.2

filename	sha256 hash
kubernetes.tar.gz	240f66a98bf75246b53ef7c1fa3a2be36a92cbc173bc8626e7bc4427bef9ce
kubernetes-src.tar.gz	dbf19a8f2e50b3e691eeba0c418fe057f1ea8527b8c0194ba9749c12c801b2

### Client Binaries

filename	sha256 hash
kubernetes-client-darwin-386.tar.gz	3b1437cbc9d10e5466c83304c54ab06f5a880e0b047e2b0ea775530ee893b61
kubernetes-client-darwin-amd64.tar.gz	e3dad0848b3d6c1737199d0704c692e74bf979e6a81fabea79c5b2499ca3fa7
kubernetes-client-linux-386.tar.gz	962f576e67f13f8f8afc958f89f0371c7496b2540372ef7f8e1bd0e43a67e82
kubernetes-client-linux-amd64.tar.gz	f8ef17b8b4bb8f6974fa2b3faa992af3c39ad318c30bdfefab957361d8bd1
kubernetes-client-linux-arm64.tar.gz	9582e6783e7effa10b0af2f662d1bc4471bbf8205d9df07a543edb099ba7f27
kubernetes-client-linux-arm.tar.gz	165b642ba6900f7d779bc6a27f89ccdb09eefcbb310a8bc5f6d101db27e2e90
kubernetes-client-linux-ppc64le.tar.gz	514a308ccfb978111a74b5bf843cf6862464743f0f4e2aaffada33add4c2bb0
kubernetes-client-linux-s390x.tar.gz	e030593109a369bc3288c9f47703843248dbe4a9ade496f936d8cc355a874ba

filename	sha256 hash
kubernetes-client-windows-386.tar.gz	a2b0053de6b62d09123d8fcc1927a8cf9ab2a5a312794a858e7b423f4ffdbec3
kubernetes-client-windows-amd64.tar.gz	eafdaa29a70d1820be0dc181074c5788127996402bbd5af53b0b765ed244e47

## Server Binaries

filename	sha256 hash
kubernetes-server-linux-amd64.tar.gz	016bc4db69a8f90495e82fbe6e5ec9a12e56ecab58a8eb2e5471bf9cab827a
kubernetes-server-linux-arm64.tar.gz	1985596d769656d68ec692030dd31bbec8081daf52ddaef6a2a7af7d6b1f787
kubernetes-server-linux-arm.tar.gz	e0d4c53c55de5c100973379005aabe1441004ed4213b96a6e492c88d5a9b7f4
kubernetes-server-linux-ppc64le.tar.gz	652a8230c4511bc30d8f3a6ae11ebeee8c6d350648d879f8f2e1aa34777323c
kubernetes-server-linux-s390x.tar.gz	1eab2d36beecf4f74e3b7b74734a75faf43ed6428d312aeb2e940df4cce5e

## Changelog since v1.6.1

### Other notable changes

- Fix for Windows kubect1 sending full path to binary in User Agent. (#44622, @monopole)
- kube-apiserver now drops unneeded path information if an older version of Windows kubect1 sends it. (#44421, @mml)
- CRI: Fix kubelet failing to start when using rkt. (#44569, @yujuhong)
- CRI: `kubect1 logs -f` now stops following when container stops, as it did pre-CRI. (#44406, @Random-Liu)
- Azure cloudprovider: Reduce the polling delay for all azure clients to 5 seconds. This should speed up some operations at the cost of some additional quota. (#43699, @colemickens)
- kubeadm: clean up exited containers and network checkpoints (#43836, @yujuhong)
- Fix corner-case with OnlyLocal Service healthchecks. (#44313, @thockin)
- Fix for disabling federation controllers through override args. (#44341, @irfanurrehman)
- Fix for federation failing to propagate cascading deletion. (#44108, @csbell)
- Fix for failure to delete federation controllers with finalizers. (#44084, @nikhiljindal)

- Fix transition between NotReady and Unreachable taints. (#44042, @gmarek)
- AWS cloud provider: fix support running the master with a different AWS account or even on a different cloud provider than the nodes. (#44235, @mrIncompetent)
- kubeadm: Make `kubeadm reset` tolerant of a disabled docker service. (#43951, @luxas)
- Fix broken service accounts when using dedicated service account key. (#44169, @mikedanese)
- Fix for kube-proxy healthcheck handling an update that simultaneously removes one port and adds another. (#44246, @thockin)
- Fix container hostPid settings when CRI is enabled. (#44116, @feiskyer)
- RBAC role and rolebinding auto-reconciliation is now performed only when the RBAC authorization mode is enabled. (#43813, @liggitt)
- Fix incorrect conflict errors applying strategic merge patches to resources. (#43871, @liggitt)
- Fixed an issue mounting the wrong secret into pods as a service account token. (#44102, @ncdc)
- AWS cloud provider: allow to set KubernetesClusterID or KubernetesClusterTag in combination with VPC. (#42512, @scheeles)
- kubeadm: Remove hard-coded default version when fetching stable version from the web fails. Fixes kubeadm 1.6.1 deploying 1.6.0 control plane. (#43999, @mikedanese)
- Fixed recognition of default storage class in DefaultStorageClass admission plugin. (#43945, @mikkeloscar)
- Fix Kubelet panic when Docker is not running. (#44047, @yujuhong)
- Fix vSphere volumes in SELinux environment. (#42973, @gnufied)
- Fix bug with error “Volume has no class annotation” when deleting a PersistentVolume. (#43982, @jsafrane)

## v1.6.1

Documentation & Examples

### Downloads for v1.6.1

filename	sha256 hash
kubernetes.tar.gz	f1634e22ee3fe8af5c355c3f53d1b93f946490addfab029e19acf5317c51cd3
kubernetes-src.tar.gz	b818f29661dd34db77d1e46c6ba98df6d35906dbc36ac1fdfe45f770b0f695

### Client Binaries



filename	sha256 hash
kubernetes-client-darwin-386.tar.gz	6eb7a0749de4c66d66630ac831f9a0aa73af9be856776c428d6adb3e07479d4
kubernetes-client-darwin-amd64.tar.gz	05715224efdda0da3241960ec6cc71c2b008d3a53d217e5f90b159b5274db24
kubernetes-client-linux-386.tar.gz	7608a4754e48297dac8be9e863c429676f35afb97a9a10897e15038df6499a2
kubernetes-client-linux-amd64.tar.gz	21e85cd3388b131fd1b63b06ea7ace8eef9555b7c558900b0cf1f9a3f2733e5
kubernetes-client-linux-arm64.tar.gz	b798e4b440df52e35809310147f8678a1d9b822dce85212fcf382d19ec2bd80
kubernetes-client-linux-arm.tar.gz	3227e745db3986a6be9c16c8fffb4f40ce604a400c680e2e6ff92368e72a5970
kubernetes-client-linux-ppc64le.tar.gz	ab7c9b2516d3cda8b4c236e00a179448e0787670cfd20c66dfb1b0c6c73ef0c
kubernetes-client-linux-s390x.tar.gz	9fbcfb5f1b092573e5db5188689d7709a03b2bfdae635f61b5dbf72ae9dde2a2
kubernetes-client-windows-386.tar.gz	306566c6903111769f01b0d05ba66aed63c133501adf49ef8daa38cc6a78097
kubernetes-client-windows-amd64.tar.gz	5ca89e1672fd29a13a7cb997480216643e98afeba4d19ab081877281d0db806

## Server Binaries

filename	sha256 hash
kubernetes-server-linux-amd64.tar.gz	3e5c7103f44f20a95db29243a43f04aca731c8a4d411c80592ea49f7550d875
kubernetes-server-linux-arm64.tar.gz	3fad77963f993396786e1777aecb770572b8b06cc3fe985c688916a70ffee21
kubernetes-server-linux-arm.tar.gz	4b981751da6a0bf471e52e55b548d62c038f7e6d8ed628b8177389f24cfd043
kubernetes-server-linux-ppc64le.tar.gz	7b4bdf49cc2510af81205f2a65653a577fc79623c76c7ed3c29c2fbe1d83577
kubernetes-server-linux-s390x.tar.gz	3c55f1322ca39b7acb4914dd174978b015c1124e1ddd5431ec14c97b1b45f69

## Changelog since v1.6.0

### Other notable changes

- Fix a deadlock in kubeadm master initialization. (#43835, @mikedanese)
- Use Cluster Autoscaler 0.5.1, which fixes an issue in Cluster Autoscaler 0.5 where the cluster may be scaled up unnecessarily. Also the status of

Cluster Autoscaler is now exposed in kube-system/cluster-autoscaler-status  
config map. (#43745, @mwielgus)

## v1.6.0

Documentation & Examples

### Downloads for v1.6.0

filename	sha256 hash
kubernetes.tar.gz	e89318b88ea340e68c427d0aad701e544ce2291195dc1d5901222e7bae48f03
kubernetes-src.tar.gz	0b03d27e1c7af3be5d94ecd5f679e5f55588d801376cf1ae170d9ec0a229b1e

### Client Binaries

filename	sha256 hash
kubernetes-client-darwin-386.tar.gz	274277a67a85e9081d9fee5e763ed7c3dd096acf641c31a9ccc916a3981feac
kubernetes-client-darwin-amd64.tar.gz	af8d1aa034721b31fd14f7b93f5ef16f8dbac4fdcd9e312c3c61e6cf0329505
kubernetes-client-linux-386.tar.gz	4c6a3c12f131c3c88612f888257d00a3cc7fef67947757b897b0d8be9fab547
kubernetes-client-linux-amd64.tar.gz	4a5daf0459dfc24bf0ccbb2fc881f688008e91ae41fde961b81d09b0801004
kubernetes-client-linux-arm64.tar.gz	91d5e31407140a55cf00c0dc6e20aa8433cc918615dedd842637585e81694e1
kubernetes-client-linux-arm.tar.gz	985fec7fb94b42c25b8a56efde1831b2616a6792d3d5a02549248e01ce524e
kubernetes-client-linux-ppc64le.tar.gz	303279f935289cadfb97a6a5d3f58b0da67d1b88b5ed049e6a98fc203b7b9d5
kubernetes-client-linux-s390x.tar.gz	2bd216c6b7d4f09de02c3b5d20021124f7d04f483ab600b291c515386003ca7
kubernetes-client-windows-386.tar.gz	11d5459b0d413a25045c55ce3548d30616ddc2d62451280d3299baa9f3e3e03
kubernetes-client-windows-amd64.tar.gz	84eba6f2b2b82a95397688b1e2ca4deb8d7daf1f8a40919fa0312741ca25379

### Server Binaries

filename	sha256 hash
kubernetes-server-linux-amd64.tar.gz	3625b63d573aa4d28eaa30b291017f775f2ddc0523f40d25023ad1da9c30390
kubernetes-server-linux-arm64.tar.gz	906496c985d4d836466b73e1c9e618ea8ce07f396aba3a96edcdc6045e0ab4e
kubernetes-server-linux-arm.tar.gz	3b63f481156f57729bc8100566d8b3d7856791e5b36bb70042e17d21f11f8d5
kubernetes-server-linux-ppc64le.tar.gz	382666b3892fd4d89be5e4bb052dd0ef0d1c1d213c1ae7a92435083a105064f
kubernetes-server-linux-s390x.tar.gz	e15de8896bd84a9b74756adc1a2e20c6912a65f6ff0a3f3dfabc8b463e31d19

## WARNING: etcd backup strongly recommended

Before updating to 1.6, you are strongly recommended to back up your etcd data. Please consult the installation procedure you are using (kargo, kops, kube-up, kube-aws, kubeadm etc) for specific advice.

1.6 encourages etcd3, and switching from etcd2 to etcd3 involves a full migration of data between different storage engines. You must stop the API from writing to etcd during an etcd2 -> etcd3 migration. HA installations cannot be migrated at the current time using the official Kubernetes procedure.

1.6 will also default to protobuf encoding if using etcd3. **This change is irreversible.** To rollback, you must restore from a backup made before the protobuf/etcd3 switch, and any changes since the backup will be lost. As 1.5 does not support protobuf encoding, if you roll back to 1.5 after upgrading to protobuf you will be forced to restore from backup, and you will lose any changes since you converted to protobuf. After conversion to protobuf, you should validate the correct operation of your cluster thoroughly before returning it to normal operation.

Backups are always a good precaution, particularly around upgrades, but this upgrade has multiple known issues where the only remedy is to restore from backup.

Also, please note: - using `application/vnd.kubernetes.protobuf` as the media storage type for 1.6 is default but not required - the ability to rollback to etcd2 can be preserved by setting the storage media type flag on `kube-apiserver`

`--storage-media-type application/json`

to continue to use `application/json` as the storage media type which can be changed to `application/vnd.kubernetes.protobuf` at a later time.

## Major updates and release themes

- Kubernetes now supports up to 5,000 nodes via etcd v3, which is enabled by default.
- Role-based access control (RBAC) has graduated to beta, and defines secure default roles for control plane, node, and controller components.
- The `kubeadm` cluster bootstrap tool has graduated to beta. Some highlights:
  - **WARNING:** A known issue in v1.6.0 causes `kubeadm init` to hang. Please use v1.6.1, which fixes the issue.
  - All communication is now over TLS
  - Authorization plugins can be installed by `kubeadm`, including the new default of RBAC
  - The bootstrap token system now allows token management and expiration
- The `kubefed` federation bootstrap tool has also graduated to beta.
- Interaction with container runtimes is now through the CRI interface, enabling easier integration of runtimes with the kubelet. Docker remains the default runtime via Docker-CRI (which moves to beta).
  - **WARNING:** A known issue in v1.6.0 causes `Pod.Spec.HostPid` (using the host PID namespace for the pod) to always be false. Please wait for v1.6.2, which will include a fix for this issue.
- Various scheduling features have graduated to beta:
  - You can now use multiple schedulers
  - Nodes and pods now support affinity and anti-affinity
  - Advanced scheduling can be performed with taints and tolerations
- You can now specify (per pod) how long a pod should stay bound to a node, when there is a node problem.
- Various storage features have graduated to GA:
  - StorageClass pre-installed and set as default on Azure, AWS, GCE, OpenStack, and vSphere
  - Configurable Dynamic Provisioning and StorageClass
- DaemonSets can now be updated by a rolling update.

## Action Required

### Certificates API

- Users of the alpha certificates API should delete v1alpha1 CSRs from the API before upgrading and recreate them as v1beta1 CSR after upgrading. (#39772, @mikedanese)

### Cluster Autoscaler

- If you are using (or planning to use) Cluster Autoscaler please wait for Kubernetes 1.6.1. In 1.6.0 Cluster Autoscaler may occasionally increase the size of the cluster a bit more than it is actually needed, when there are unschedulable pods, scale up is required and cloud provider is slow to

set up networking for new nodes. Anyway, the cluster should get back to the proper size after 10 min.

## Deployment

- Deployment now fully respects ControllerRef to avoid fighting over Pods and ReplicaSets. At the time of upgrade, **you must not have Deployments with selectors that overlap**, or else ownership of ReplicaSets may change. (#42175, @enisoc)

## Federation

- The `-dns-provider` argument of `'kubefed init'` is now mandatory and does not default to `google-clouddns`. To initialize a Federation control plane with Google Cloud DNS, use the following invocation: `'kubefed init -dns-provider=google-clouddns'` (#42092, @marun)
- Cluster federation servers have changed the location in etcd where federated services are stored, so existing federated services must be deleted and recreated. Before upgrading, export all federated services from the federation server and delete the services. After upgrading the cluster, recreate the federated services from the exported data. (#37770, @enj)

## Internal Storage Layer

- upgrade to etcd3 prior to upgrading to 1.6 **OR** explicitly specify `--storage-backend=etcd2 --storage-media-type=application/json` when starting the apiserver

## Node Components

- **Kubelet with the Docker-CRI implementation**
  - The Docker-CRI implementation is enabled by default.
  - It is not compatible with containers created by older Kubelets. It is recommended to drain your node before upgrade. If you choose to perform an in-place upgrade, the Kubelet will automatically restart all Kubernetes-managed containers on the node.
  - It is not compatible with CNI plugins that do not conform to the error handling behavior in the spec. The plugins are being updated to resolve this issue (#43488). You can disable CRI explicitly (`--enable-cri=false`) as a temporary workaround.
    - \* The standard **bridge** plugin have been validated to interoperate with the new CRI + CNI code path.
    - \* If you are using plugins other than **bridge**, make sure you have updated custom plugins to the latest version that is compatible.
- **CNI plugins now affect node readiness**
  - Kubelet will now block node readiness until a CNI configuration file is present in `/etc/cni/net.d` or a given custom CNI configuration

path. This change ensures kubelet does not start pods that require networking before networking is ready. This change may require changes to clients that gate pod creation and/or scheduling on the node condition `type Ready status` being `True` for pods that need to run prior to the network being ready.

- **Enhance Kubelet QoS:**

- Pods are placed under a new cgroup hierarchy by default. This feature requires draining and restarting the node as part of upgrades. To opt-out set `--cgroups-per-qos=false`.
  - If `kube-reserved` and/or `system-reserved` are specified, node allocatable will be enforced on all pods by default. To opt-out set `--enforce-node-allocatable=""`
  - Hard Eviction Thresholds will be subtracted from Capacity while calculating Node Allocatable. This will result in a reduction of schedulable capacity in clusters post upgrade where kubelet hard eviction has been turned on for memory. To opt-out set `--experimental-allocatable-ignore-eviction=true`.
  - More details on these feature here: <https://kubernetes.io/docs/tasks/administer-cluster/reserve-compute-resources/>
- Drop the support for docker 1.9.x. Docker versions 1.10.3, 1.11.2, 1.12.6 have been validated.
  - The following deprecated kubelet flags are removed: `--config`, `--auth-path`, `--resource-container`, `--system-container`, `--reconcile-cidr`
  - Remove the temporary fix for pre-1.0 mirror pods. Upgrade directly from pre-1.0 to 1.6 kubelet is not supported.
  - Fluentd was migrated to Daemon Set, which targets nodes with `beta.kubernetes.io/fluentd-ds-ready=true` label. If you use fluentd in your cluster please make sure that the nodes with version 1.6+ contains this label.

## kubect1

- Running `kubect1 taint` (alpha in 1.5) against a 1.6 server requires upgrading kubect1 to version 1.6
- Running `kubect1 taint` (alpha in 1.5) against a 1.5 server requires a kubect1 version of 1.5
- Running `kubect1 create secret` no longer accepts passing multiple values to a single `--from-literal` flag using comma separation
  - Update command invocations to pass separate `--from-literal` flags for each value

## RBAC

- Default `ClusterRole` and `ClusterRoleBinding` objects are automatically updated at server start to add missing permissions and subjects (extra permissions and subjects are left in place). To pre-

vent autoupdating a particular role or rolebinding, annotate it with `rbac.authorization.kubernetes.io/autoupdate=false`. (#41155, @liggitt)

- **v1beta1** RoleBinding/ClusterRoleBinding subjects changed `apiVersion` to `apiGroup` to fully-qualify a subject. ServiceAccount subjects default to an `apiGroup` of "", User and Group subjects default to an `apiGroup` of `"rbac.authorization.k8s.io"`. (#41184, @liggitt)
- To create or update an RBAC RoleBinding or ClusterRoleBinding object, a user must: (#39383, @liggitt)
  1. Be authorized to make the create or update API request
  2. Be allowed to bind the referenced role, either by already having all of the permissions contained in the referenced role, or by having the "bind" permission on the referenced role.
- The `--authorization-rbac-super-user` flag (alpha in 1.5) is deprecated; the `system:masters` group has privileged access (#38121, @deads2k)
- special handling of the user `*` in RoleBinding and ClusterRoleBinding objects is removed in v1beta1. To match all users, explicitly bind to the group `system:authenticated` and/or `system:unauthenticated`. Existing v1alpha1 bindings to the user `*` are automatically converted to the group `system:authenticated`. (#38981, @liggitt)

## Scheduling

- **Multiple schedulers**
  - Modify your PodSpecs that currently use the `scheduler.alpha.kubernetes.io/name` annotation on Pod, to instead use the `schedulerName` field in the PodSpec.
  - Modify any custom scheduler(s) you have written so that they read the `schedulerName` field on Pod instead of the `scheduler.alpha.kubernetes.io/name` annotation.
  - Note that you can only start using the `schedulerName` field **after** you upgrade to 1.6; it is not recognized in 1.5.
- **Node affinity/anti-affinity and pod affinity/anti-affinity**
  - You can continue to use the alpha version of this feature (with one caveat – see below), in which you specify affinity requests using Pod annotations, in 1.6 by including `AffinityInAnnotations=true` in `--feature-gates`, such as `--feature-gates=FooBar=true,AffinityInAnnotations=true`. Otherwise, you must modify your PodSpecs that currently use the `scheduler.alpha.kubernetes.io/affinity` annotation on Pod, to instead use the `affinity` field in the PodSpec. Support for the annotation will be removed in a future release, so we encourage you to switch to using the field as soon as possible.
  - Caveat: The alpha version no longer supports, and the beta version does not support, the "empty `podAffinityTerm.namespaces` list means all namespaces" behavior. In both alpha and beta it now

means “same namespace as the pod specifying this affinity rule.”

- Note that you can only start using the **affinity** field **after** you upgrade to 1.6; it is not recognized in 1.5.
- The **--failure-domains** scheduler command line-argument is not supported in the beta version of the feature.

- **Taints**

- You will need to use **kubectl taint** to re-create all of your taints after **kubectl** and the master are upgraded to 1.6. Between the time the master is upgraded to 1.6 and when you do this, your existing taints will have no effect.
- You can find out what taints you have in place on a node while you are still running Kubernetes 1.5 by doing **kubectl describe node <node name>**; the **Taints** section will show the taints you have in place. To see the taints that were created under 1.5 when you are running 1.6, do **kubectl get node <node name> -o yaml** and look for the “Annotation” section with the annotation key **scheduler.alpha.kubernetes.io/taints**
- You can remove the “old” taints (stored internally as annotations) at any time after the upgrade by doing **kubectl annotate nodes <node name> scheduler.alpha.kubernetes.io/taints-** (note the minus at the end, which means “delete the taint with this key”)
- Note that because any taints you might have created with Kubernetes 1.5 can only affect the scheduling of new pods (the **NoExecute** taint effect is introduced in 1.6), neither the master upgrade nor your running **kubectl taint** to re-create the taints will affect pods that are already running.
- Rescheduler relies on taints, which were changed in a backward incompatible way. Rescheduler 0.3 shipped together with Kubernetes 1.6 understands the new taints and will clean up the old annotations, but Rescheduler 0.2 shipped together with Kubernetes 1.5 doesn’t understand the new taints. In order to avoid eviction loop during 1.5->1.6 upgrade you need to either upgrade the master node atomically (for example by using **upgrade.sh** script for GCE) or ensure that the rescheduler is upgraded first, then the scheduler and then all the other master components.

- **Tolerations**

- After your master is upgraded to 1.6, you will need to update your PodSpecs to set the **tolerations** field of the PodSpec and remove the **scheduler.alpha.kubernetes.io/tolerations** annotation on the Pod. (It’s not strictly necessary to remove the annotation, as it will have no effect once you upgrade to 1.6.) Between the time the master is upgraded to 1.6 and when you do this, tolerations attached to Pods that are created will have no effect. Pods that are already running will not be affected by the upgrade.
- You can find the PodSpec tolerations that were created as annotations (if any) in a controller definition by doing **kubectl**



- ```
get <controller kind> <controller name> -o yaml
```

 and looking for the “Annotation” section with the annotation key `scheduler.alpha.kubernetes.io/tolerations` (This will work whether you are running Kubernetes 1.5 or 1.6).
- To update a controller’s PodSpec to use the field instead of the annotation, use one of the `kubectl` commands that do update (“`kubectl replace`” or “`kubectl apply`” or “`kubectl patch`”) or just delete the controller entirely and re-create it with a new pod template. Note that you will be able to do these things only after the upgrade.

## Service

- The ‘`endpoints.beta.kubernetes.io/hostnames-map`’ annotation is no longer supported. Users can use the ‘`Endpoints.subsets[].addresses[].hostname`’ field instead. (#39284, @bowei)

## StatefulSet

- StatefulSet now respects `ControllerRef` to avoid fighting over Pods. At the time of upgrade, **you must not have StatefulSets with selectors that overlap** with any other controllers (such as `ReplicaSets`), or else ownership of Pods may change. (#42080, @enisoc)

## Volumes

- `StorageClass` pre-installed and set as default on Azure, AWS, GCE, OpenStack, and vSphere.
  - This is something to pay close attention to if you’ve been using Kubernetes for a while, because it changes the default behavior of `PersistentVolumeClaim` objects on these clouds.
  - Marking a `StorageClass` as default makes it so that even a `PersistentVolumeClaim` without a `StorageClass` specified will trigger dynamic provisioning (instead of binding to an existing pool of PVs).
  - If you depend on the old behavior of volumes binding to existing pool of `PersistentVolume` objects then modify the `StorageClass` object and set `storageclass.beta.kubernetes.io/is-default-class` to `false`.
- Flex volume plugin is updated to support attach/detach interfaces. It broke backward compatibility. Please update your drivers and implement the new callouts. (#41804, @chakri-nelluri)

## Notable Features

Features for this release were tracked via the use of the `kubernetes/features` issues repo. Each Feature issue is owned by a Special Interest Group from the `kubernetes/community`.

## Autoscaling

- **[alpha]** The Horizontal Pod Autoscaler now supports drawing metrics through the API server aggregator.
- **[alpha]** The Horizontal Pod Autoscaler now supports scaling on multiple, custom metrics.
- Cluster Autoscaler publishes its status to kube-system/cluster-autoscaler-status ConfigMap.
- Cluster Autoscaler can continue operations while some nodes are broken or unready.
- Cluster Autoscaler respects Pod Disruption Budgets when removing a node.

## DaemonSet

- **[beta]** Introduce the rolling update feature for DaemonSet. See Performing a Rolling Update on a DaemonSet.

## Deployment

- **[beta]** Deployments that cannot make progress in rolling out the newest version will now indicate via the API they are blocked (docs)

## Federation

- **[beta]** kubefed has graduated to beta: supports hosting federation on on-prem clusters, automatically configures **kube-dns** in joining clusters and allows passing arguments to federation components.

## Internal Storage Layer

- **[stable]** The internal storage layer for kubernetes cluster state has been updated to use etcd v3 by default. Existing clusters will have to plan for a data migration window. (docs)(kubernetes/features#44)

## kubeadm

- **[beta]** Introduces an API for clients to request TLS certificates from the API server. See the tutorial.
- **[beta]** kubeadm is enhanced and improved with a baseline feature set and command line flags that are now marked as beta. Other parts of kubeadm, including subcommands under **kubeadm alpha**, are still in alpha. Using it is considered safe, although note that upgrades and HA are not yet supported. Please try it out and give us feedback!
- **[alpha]** New Bootstrap Token authentication and management method. Works well with kubeadm. kubeadm now supports managing tokens, including time based expiration, after the cluster is launched. See kubeadm reference docs for details.

- **[alpha]** Adds a new cloud-controller-manager binary that may be used for testing the new out-of-core cloudprovider flow.

## Node Components

- **[stable]** Init containers have graduated to GA and now appear as a field. The beta annotation value will still be respected and overrides the field value.
- Kubelet Container Runtime Interface (CRI) support
  - **[beta]** The Docker-CRI implementation is enabled by default in kubelet. You can disable it by `--enable-cri=false`. See notes on the new implementation for more details.
  - **[alpha]** Alpha support for other runtimes: cri-o, frakti, rkt.
- **[beta]** Node Problem Detector is beta (v0.3.0) now. New features added into node-problem-detector:v0.3.0:
  - Add support for journald.
  - The ability to monitor any system daemon logs. Previously only kernel logs were supported.
  - The ability to be deployed and run as a native daemon.
- **[alpha]** Critical Pods: When feature gate “ExperimentalCriticalPodAnnotation” is set to true, the system will guarantee scheduling and admission of pods with the following annotation - `scheduler.alpha.kubernetes.io/critical-pod`
  - This feature should be used in conjunction with the rescheduler to guarantee resource availability for critical system pods.
- **[alpha]** `--experimental-nvidia-gpus` flag is replaced by `Accelerators` alpha feature gate along with addition of support for multiple Nvidia GPUs.
  - To use GPUs, pass `Accelerators=true` as part of `--feature-gates` flag.
  - More information [here](#).
- A pod’s Quality of Service Class is now available in its Status.
- Upgrade cAdvisor library to v0.25.0. Notable changes include,
  - Container filesystem usage tracking disabled for device mapper due to excessive IOPS.
  - Ignore `.mount` cgroups, fixing disappearing stats.
- A new field `terminationMessagePolicy` has been added to containers that allows a user to request `FallbackToLogsOnError`, which will read from the container’s logs to populate the termination message if the user does not write to the termination message log file. The termination message file is now properly readable for end users and has a maximum size (4k bytes) to prevent abuse. Each pod may have up to 12k bytes of termination messages before the contents of each will be truncated.
- Do not delete pod objects until all its compute resource footprint has been reclaimed.
  - This feature prevents the node and scheduler from oversubscribing

- resources that are still being used by a pod in the process of being cleaned up.
- This feature can result in increase of Pod Deletion latency especially if the pod has a large filesystem footprint.

## RBAC

- **[beta]** RBAC API is promoted to v1beta1 (rbac.authorization.k8s.io/v1beta1), and defines default roles for control plane, node, and controller components.
- **[beta]** The Docker-CRI implementation is Beta and is enabled by default in kubelet. You can disable it by `--enable-cri=false`. See notes on the new implementation for more details.

## Scheduling

- **[beta]** The multiple schedulers. This feature allows you to run multiple schedulers in parallel, each responsible for different sets of pods. When using multiple schedulers, the scheduler name is now specified in a new-in-1.6 `schedulerName` field of the PodSpec rather than using the `scheduler.alpha.kubernetes.io/name` annotation on the Pod. When you upgrade to 1.6, the Kubernetes default scheduler will start using the `schedulerName` field of the PodSpec and will ignore the annotation.
- **[beta]** Node affinity/anti-affinity and **[beta]** pod affinity/anti-affinity. Node affinity/anti-affinity allow you to specify rules for restricting which node(s) a pod can schedule onto, based on the labels on the node. Pod affinity/anti-affinity allow you to specify rules for spreading and packing pods relative to one another, across arbitrary topologies (node, zone, etc.) These affinity rules are now be specified in a new-in-1.6 `affinity` field of the PodSpec. Kubernetes 1.6 continues to support the alpha `scheduler.alpha.kubernetes.io/affinity` annotation on the Pod if you explicitly enable the alpha feature “AffinityInAnnotations”, but it will be removed in a future release. When you upgrade to 1.6, if you have not enabled the alpha feature, then the scheduler will use the `affinity` field in PodSpec and will ignore the annotation. If you have enabled the alpha feature, then the scheduler will use the `affinity` field in PodSpec if it is present, and otherwise will use the annotation.
- **[beta]** Taints and tolerations. This feature allows you to specify rules for “repelling” pods from nodes by default, which enables use cases like dedicated nodes and reserving nodes with special features for pods that need those features. We’ve also added a `NoExecute` taint type that evicts already-running pods, and an associated `tolerationSeconds` field to tolerations to delay the eviction for a specified amount of time. As before, taints are created using `kubectl taint` (but internally they are now represented as a field `taints` in the NodeSpec rather than using the `scheduler.alpha.kubernetes.io/taints` annotation on Node). Tolerations are now specified in a new-in-1.6 `tolerations` field of the PodSpec

rather than using the `scheduler.alpha.kubernetes.io/tolerations` annotation on the Pod. When you upgrade to 1.6, the scheduler will start using the fields and will ignore the annotations.

- **[alpha]** Represent node problems “not ready” and “unreachable” using `NoExecute` taints. In combination with `tolerationSeconds` described below, this allows per-pod specification of how long to remain bound to a node that becomes unreachable or not ready, rather than using the default of 5 minutes. You can enable this alpha feature by including `TaintBasedEvictions=true` in `--feature-gates`, such as `--feature-gates=FooBar=true,TaintBasedEvictions=true`. Documentation is [here](#).

## Service Catalog

- **[alpha]** Adds a new API resource `PodPreset` and admission controller to enable defining cross-cutting injection of Volumes and Environment into Pods.

## Volumes

- **[stable]** StorageClass API is promoted to v1 (`storage.k8s.io/v1`).
- **[stable]** Default storage classes are deployed during installation on Azure, AWS, GCE, OpenStack and vSphere.
- **[stable]** Added ability to populate environment variables from a configmap or secret.
- **[stable]** Support for user-written/run dynamic PV provisioners. The Kubernetes Incubator contains a golang library and examples.
- **[stable]** Volume plugin for ScaleIO enabling pods to seamlessly access and use data stored on Dell EMC ScaleIO volumes.
- **[stable]** Volume plugin for Portworx added capability to use Portworx as a storage provider for Kubernetes clusters. Portworx pools server capacity and turns servers or cloud instances into converged, highly available compute and storage nodes.
- **[stable]** Add support to use NFSv3, NFSv4, and GlusterFS on GCE/GKE GCI image based clusters.
- **[beta]** Added support for mount options in persistent volumes.
- **[alpha]** All in one volume proposal - a new volume driver capable of projecting secrets, configmaps, and downward API items into the same directory.

## Deprecations

- Remove extensions/v1beta1 Jobs resource, and job/v1beta1 generator. (#38614, @soltys)
- `federation/deploy/deploy.sh` was an interim solution introduced in Kubernetes v1.4 to simplify the federation control plane deployment expe-

rience. Now that we have **kubefed**, we are deprecating **deploy.sh** scripts. (#38902, @madhusudancs)

### Cluster Provisioning Scripts

- The bash AWS deployment via kube-up.sh has been deprecated. See <http://kubernetes.io/docs/getting-started-guides/aws/> for alternatives. (#38772, @zmerlynn)
- Remove Azure kube-up as the Azure community has focused efforts elsewhere. (#41672, @mikedanese)
- Remove the deprecated vsphere kube-up. (#39140, @kerneltime)

### kubeadm

- Quite a few flags been renamed or removed. Those options that are removed as flags can still be accessed via the config file. Most notably this includes external etcd settings and the option for setting the cloud provider on the API server. The kubeadm reference documentation is up to date with the new flags.

### Other Deprecations

- Remove cmd/kube-discovery from the tree since it's not necessary anymore (#42070, @luxas)

## Changes to API Resources

### ABAC

- ABAC policies using "user": "\*" or "group": "\*" to match all users or groups will only match authenticated requests. To match unauthenticated requests, ABAC policies must explicitly specify "group": "system:unauthenticated" (#38968, @liggitt)

### Admission Control

- Adds a new API resource **PodPreset** and admission controller to enable defining cross-cutting injection of Volumes and Environment into Pods. (#41931, @jessfraz)
- Enable **DefaultTolerationSeconds** admission controller by default (#41815, @kevin-wangzefeng)
- **ResourceQuota** ability to support default limited resources (#36765, @derekwayneccarr)
- Add **defaultTolerationSeconds** admission controller (#41414, @kevin-wangzefeng)
- An **automountServiceAccountToken** field was added to **ServiceAccount** and **PodSpec** objects. If set to **false** on a pod spec, no service account

token is automounted in the pod. If set to **false** on a service account, no service account token is automounted for that service account unless explicitly overridden in the pod spec. (#37953, @liggitt)

- Admission control support for versioned configuration files (#39109, @derekwaynecarr)
- Ability to quota storage by storage class (#34554, @derekwaynecarr)

## Authentication

- The authentication.k8s.io API group was promoted to v1 (#41058, @liggitt)

## Authorization

- The authorization.k8s.io API group was promoted to v1 (#40709, @liggitt)
- The SubjectAccessReview API now passes subresource and resource name information to the authorizer to answer authorization queries. (#40935, @liggitt)

## Autoscaling

- Introduces an new alpha version of the Horizontal Pod Autoscaler including expanded support for specifying metrics. (#36033, @DirectXMan12)
- HorizontalPodAutoscaler is no longer supported in extensions/v1beta1 version. Use autoscaling/v1 instead. (#35782, @piosz)
- Fixes an HPA-related panic due to division-by-zero. (#39694, @DirectXMan12)

## Certificates

- The CertificateSigningRequest API added the **extra** field to persist all information about the requesting user. This mirrors the fields in the SubjectAccessReview API used to check authorization. (#41755, @liggitt)
- Native support for token based bootstrap flow. This includes signing a well known ConfigMap in the **kube-public** namespace and cleaning out expired tokens. (#36101, @jbeda)

## ConfigMap

- Volumes and environment variables populated from ConfigMap and Secret objects can now tolerate the named source object or specific keys being missing, by adding **optional: true** to the volume or environment variable source specifications. (#39981, @fraenkel)
- Allow pods to define multiple environment variables from a whole ConfigMap (#36245, @fraenkel)

## CronJob

- Add configurable limits to CronJob resource to specify how many successful and failed jobs are preserved. (#40932, @peay)

## DaemonSet

- DaemonSet now respects ControllerRef to avoid fighting over Pods. (#42173, @enisoc)
- Make DaemonSet respect critical pods annotation when scheduling. (#42028, @janetkuo)
- Implement the update feature for DaemonSet. (#41116, @lukaszo)
- Make DaemonSets survive taint-based evictions when nodes turn unreachable/notReady. (#41896, @kevin-wangzefeng)
- Make DaemonSet controller respect node taints and pod tolerations. (#41172, @janetkuo)
- DaemonSet controller actively kills failed pods (to recreate them) (#40330, @janetkuo)
- DaemonSet ObservedGeneration (#39157, @lukaszo)

## Deployment

- Add ready replicas in Deployments (#37959, @kargakis)
- Deployments that cannot make progress in rolling out the newest version will now indicate via the API they are blocked
- Introduce apps/v1beta1.Deployments resource with modified defaults compared to extensions/v1beta1.Deployments. (#39683, @soltys)
- Introduce new generator for apps/v1beta1 deployments (#42362, @soltys)

## Node

- Set all node conditions to Unknown when node is unreachable (#36592, @andrewsykim)

## Pod

- Init containers have graduated to GA and now appear as a field. The beta annotation value will still be respected and overrides the field value. (#38382, @hodovska)
- A new field `terminationMessagePolicy` has been added to containers that allows a user to request `FallbackToLogsOnError`, which will read from the container's logs to populate the termination message if the user does not write to the termination message log file. The termination message file is now properly readable for end users and has a maximum size (4k bytes) to prevent abuse. Each pod may have up to 12k bytes of termination messages before the contents of each will be truncated. (#39341, @smarterclayton)



- Fix issue with PodDisruptionBudgets in which `minAvailable` specified as a percentage did not work with StatefulSet Pods. (#39454, @foxish)
- Node affinity has moved from annotations to api fields in the pod spec. Node affinity that is defined in the annotations will be ignored. (#37299, @rrati)
- Moved pod affinity and anti-affinity from annotations to api fields #25319 (#39478, @rrati)
- Add QoS pod status field (#37968, @sjenning) ### Pod Security Policy
- PodSecurityPolicy resource is now enabled by default in the extensions API group. (#39743, @pweil-)

## RBAC

- The `attributeRestrictions` field has been removed from the PolicyRule type in the rbac.authorization.k8s.io/v1alpha1 API. The field was not used by the RBAC authorizer. (#39625, @deads2k)
- A user can now be authorized to bind a particular role by having permission to perform the `bind` verb on the referenced role (#39383, @liggitt)

## ReplicaSet

- ReplicaSet has owner ref of the Deployment that created it (#35676, @krmayankk)

## Secrets

- Populate environment variables from a secrets. (#39446, @fraenkel)
- Added a new secret type “bootstrap.kubernetes.io/token” for dynamically creating TLS bootstrapping bearer tokens. (#41281, @ericchiang)

## Service

- Endpoints, that tolerate unready Pods, are now listing Pods in state Terminating as well (#37093, @simonswine)
- Fix Service Update on LoadBalancerSourceRanges Field (#37720, @freehan)
- Bug fix. Incoming UDP packets not reach newly deployed services (#32561, @zreigz)
- Services of type loadbalancer consume both loadbalancer and nodeport quota. (#39364, @zhouhaibing089)

## StatefulSet

- Fix zone placement heuristics so that multiple mounts in a StatefulSet pod are created in the same zone (#40910, @justinsb)
- Fixes issue #38418 which, under circumstance, could cause StatefulSet to deadlock. (#40838, @kow3ns)

- Mediates issue #36859. StatefulSet only acts on Pods whose identity matches the StatefulSet, providing a partial mediation for overlapping controllers.

## Taints and Tolerations

- Add a manager to NodeController that is responsible for removing Pods from Nodes tainted with NoExecute Taints. This feature is beta (as the rest of taints) and enabled by default. It's gated by controller-manager enable-taint-manager flag. (#40355, @gmarek)
- Add an alpha feature that makes NodeController set Taints instead of deleting Pods from not Ready Nodes. (#41133, @gmarek)
- Make tolerations respect wildcard key (#39914, @kevin-wangzefeng)
- Forgiveness alpha version api definition (#39469, @kevin-wangzefeng)
- Rescheduler uses taints in v1beta1 and will remove old ones (in version v1alpha1) right after its start. (#43106, @piosz)

## Volumes

- StorageClassName attribute has been added to PersistentVolume and PersistentVolumeClaim objects and should be used instead of annotation `volume.beta.kubernetes.io/storage-class`. The beta annotation is still working in this release, however it will be removed in a future release. (#42128, @jsafrane)
- Parameter keys in a StorageClass `parameters` map may not use the `kubernetes.io` or `k8s.io` namespaces. (#41837, @liggitt)
- Add storage.k8s.io/v1 API (#40088, @jsafrane)
- Alpha version of dynamic volume provisioning is removed in this release. Annotation (#40000, @jsafrane)
  - “volume.alpha.kubernetes.io/storage-class” does not have any special meaning. A default storage class
  - and DefaultStorageClass admission plugin can be used to preserve similar behavior of Kubernetes cluster,
  - see <https://kubernetes.io/docs/user-guide/persistent-volumes/#class-1> for details.
- Reduce verbosity of volume reconciler when attaching volumes (#36900, @codablock)
- We change the default attach\_detach\_controller sync period to 1 minute to reduce the query frequency through cloud provider to check whether volumes are attached or not. (#41363, @jingxu97)

## Changes to Major Components

### API Server

- `--anonymous-auth` is enabled by default, unless the API server is started with the AlwaysAllow authorizer. (#38706, @deads2k)

- **When using OIDC authentication and specifying `--oidc-username-claim=email`, an `"email_verified":true` claim must be returned from the identity provider.** (#36087, @ericchiang)
  - `--basic-auth-file` supports optionally specifying groups in the fourth column of the file (#39651, @liggitt)
- API server now has two separate limits for read-only and mutating inflight requests. (#36064, @gmarek)
- Restored normalization of custom `--etcd-prefix` when `--storage-backend` is set to `etcd3` (#42506, @liggitt)
- Updating apiserver to return http status code 202 for a delete request when the resource is not immediately deleted because of user requesting cascading deletion using `DeleteOptions.OrphanDependents=false`. (#41165, @nikhiljindal)
- Use full package path for definition name in OpenAPI spec (#40124, @mbohlool)
- Follow redirects for streaming requests (`exec/attach/port-forward`) in the apiserver by default (alpha -> beta). (#40039, @timstclair)
- Add `'X-Content-Type-Options: nosniff'` to some error messages (#37190, @brendandburns)
- Fixes bug in resolving client-requested API versions (#38533, @DirectX-Man12)
- Replace `glog.Fatals` with `fmt.Errorf`s (#38175, @sttts)
- Pipe get options to storage (#37693, @wojtek-t)
- The `--long-running-request-regex` flag to kube-apiserver is deprecated and will be removed in a future release. Long-running requests are now detected based on specific verbs (`watch`, `proxy`) or subresources (`proxy`, `portforward`, `log`, `exec`, `attach`). (#38119, @liggitt)
- if kube-apiserver is started with `--storage-backend=etcd2`, the media type `application/json` is used. (#43122, @liggitt)
- API fields that previously serialized null arrays as `null` and empty arrays as `[]` no longer distinguish between those values and always output `[]` when serializing to JSON. (#43422, @liggitt)
- Generate OpenAPI definition for inlined types (#39466, @mbohlool)

## API Server Aggregator

- Rename `kubernetes-discovery` to `kube-aggregator` (#39619, @deads2k)
- Fix connection upgrades through `kubernetes-discovery` (#38724, @deads2k)

## Generic API Server

- Move `pkg/api/rest` into `genericapiserver` (#39948, @sttts)
- Move non-generic apiserver code out of the generic packages (#38191, @sttts)
- Fixes API compatibility issue with empty lists incorrectly returning a null `items` field instead of an empty array. (#39834, @liggitt)

- Re-add /healthz/ping handler in genericapiserver (#38603, @sttts)
- Remove genericapiserver.Options.MasterServiceNamespace (#38186, @sttts)
- genericapiserver: cut off more dependencies – episode 3 (#40426, @sttts)
- genericapiserver: more dependency cutoffs (#40216, @sttts)
- genericapiserver: cut off kube pkg/version dependency (#39943, @sttts)
- genericapiserver: cut off pkg/serviceaccount dependency (#39945, @sttts)
- genericapiserver: cut off pkg/apis/extensions and pkg/storage dependencies (#39946, @sttts)
- genericapiserver: cut off certificates api dependency (#39947, @sttts)
- genericapiserver: extract CA cert from server cert and SNI cert chains (#39022, @sttts)
- genericapiserver: turn APIContainer.SecretRoutes into a real ServeMux (#38826, @sttts)
- genericapiserver: unify swagger and openapi in config (#38690, @sttts)

## Client

- Use Prometheus instrumentation conventions (#36704, @fabxc)
- Clients now use the ?watch=true parameter to make watch API calls, instead of the /watch/ path prefix (#41722, @liggitt)
- Move private key parsing from serviceaccount/jwt.go to client-go/util/cert (#40907, @cblecker)
- Caching added to the OIDC client auth plugin to fix races and reduce the time kubectl commands using this plugin take by several seconds. (#38167, @ericchiang)
- Fix resync goroutine leak in ListAndWatch (#35672, @tatsuhiro-t)

## client-go

- The main repository does not keep multiple releases of clientsets anymore. Please find previous releases at <https://github.com/kubernetes/client-go> (#38154, @caesarxuchao)
- Support whitespace in command path for gcp auth plugin (#41653, @jlowdermilk)
- client-go no longer imports GCP OAuth2 and OpenID Connect packages by default. (#41532, @ericchiang)
- Added bool type support for jsonpath. (#39063, @xingzhou)
- Preventing nil pointer reference in client\_config (#40508, @vjsamuel)
- Prevent hotloops on error conditions, which could fill up the disk faster than log rotation can free space. (#40497, @lavalamp)

## Cloud Provider

### AWS

- Allow to running the master with a different AWS account or even on a different cloud provider than the nodes. (#39996, @scheeles)
- Support shared tag `kubernetes.io/cluster/<clusterid>` (#41695, @justinsb)
- Do not consider master instance zones for dynamic volume creation (#41702, @justinsb)
- Fix AWS device allocator to only use valid device names (#41455, @gnufied)
- Trust region if found from AWS metadata (#38880, @justinsb)
- Remove duplicate calls to `DescribeInstance` during volume operations (#39842, @gnufied)
- Recognize eu-west-2 region (#38746, @justinsb)
- Recognize ca-central-1 region (#38410, @justinsb)
- Add sequential allocator for device names. (#38818, @jsafrane)

## Azure

- Fix failing load balancers in Azure (#40405, @codablock)
- Reduce time needed to attach Azure disks (#40066, @codablock)
- Remove Azure Subnet RouteTable check (#38334, @mogthesprog)
- Add support for Azure Container Registry, update Azure dependencies (#37783, @brendandburns)
- Allow backendpools in Azure Load Balancers which are not owned by cloud provider (#36882, @codablock)

## GCE

- On GCI by default logrotate is disabled for application containers in favor of rotation mechanism provided by docker logging driver. (#40634, @crassirostris)

## GKE

- New GKE certificates controller. (#41160, @pipejakob)

## vSphere

- Reverts to looking up the current VM in vSphere using the machine's UUID, either obtained via `sysfs` or via the `vm-uuid` parameter in the cloud configuration file. (#40892, @robdaemon)
- Fix for detach volume when node is not present/ powered off (#40118, @BaluDontu)
- Adding `vmrk` file extension for `vmDiskPath` in `vsphere DeleteVolume` (#40538, @divyenpatel)
- Changed default `scsi` controller type in vSphere Cloud Provider (#38426, @abrashivani)

- Fixes NotAuthenticated errors that appear in the kubelet and kube-controller-manager due to never logging in to vSphere (#36169, @robdaemon)
- Fix panic in vSphere cloud provider (#38423, @BaluDontu)
- Fix space issue in volumePath with vSphere Cloud Provider (#38338, @BaluDontu)

## Federation

### kubefed

- Flag cleanup (#41335, @irfanurrehman)
- Create configmap for the cluster kube-dns when cluster joins and remove when it unjoins (#39338, @irfanurrehman)
- Support configuring dns-provider (#40528, @shashidharatd)
- Bug fix relating kubeconfig path in kubefed init (#41410, @irfanurrehman)
- Add override flags options to kubefed init (#40917, @irfanurrehman)
- Add option to expose federation apiserver on nodeport service (#40516, @shashidharatd)
- Add option to disable persistence storage for etcd (#40862, @shashidharatd)
- kubefed init creates a service account for federation controller manager in the federation-system namespace and binds that service account to the federation-system:federation-controller-manager role that has read and list access on secrets in the federation-system namespace. (#40392, @madhusudancs)
- Implement dry run support in kubefed init (#36447, @irfanurrehman)
- Make federation etcd PVC size configurable (#36310, @irfanurrehman)

### Other Notable Changes

- Federated Ingress over GCE no longer requires separate firewall rules to be created for each cluster to circumvent flapping firewall health checks. (#41942, @csbell)
- Add support for finalizers in federated configmaps (deletes configmaps from underlying clusters). (#40464, @csbell)
- Add support for DeleteOptions.OrphanDependents for federated services. Setting it to false while deleting a federated service also deletes the corresponding services from all registered clusters. (#36390, @nikhiljindal)
- Add `--controllers` flag to federation controller manager for enable/disable federation ingress controller (#36643, @kzwang)
- Stop deleting services from underlying clusters when federated service is deleted. (#37353, @nikhiljindal)
- Expose autoscaling apis through federation api server (#38976, @irfanurrehman)
- Federation: Add `batch/jobs` API objects to federation-apiserver (#35943, @jianhuiz)

- Add logging of route53 calls (#39964, @justinsb)

## Garbage Collector

- Added foreground garbage collection: the owner object will not be deleted until all its dependents are deleted by the garbage collector. Please checkout the user doc for details. (#38676, @caesarxuchao)
  - `deleteOptions.orphanDependents` is going to be deprecated in 1.7. Please use `deleteOptions.propagationPolicy` instead.

## kubeadm

- A new label and taint is used for marking the master. The label is `node-role.kubernetes.io/master=""` and the taint has the effect `NoSchedule`. Tolerate the `node-role.kubernetes.io/master=""`:`NoSchedule` taint to schedule a workload on the master (a networking DaemonSet for example).
- The kubelet API is now secured, only cluster admins are allowed to access it.
- Insecure access to the API Server over `localhost:8080` is now disabled.
- The control plane components now talk securely to each other. The API Server talks securely to the kubelets in the cluster.
- kubeadm creates RBAC-enabled clusters. This means that some add-ons which worked previously won't work without having their YAML configuration updated. Please see each vendor's own documentation to check that the add-ons you are using will work with Kubernetes 1.6.
- The kube-discovery Deployment isn't used anymore when creating a kubeadm cluster and shouldn't be used anywhere else either due to its insecure nature.
- The Certificates API has graduated from alpha to beta. This is a backwards-incompatible change since the alpha support is dropped, and therefore kubeadm v1.5 and v1.6 don't work together (for example kubeadm v1.5 can't join a kubeadm v1.6 cluster).
- Supporting only etcd3, with 3.0.14 as the minimum version.
- `kubeadm reset` will no longer drain nodes automatically. This is because the credentials on nodes do not have permission to perform this operation. We have documented an alternate procedure, driven from the API server/master.
- Hook up kubeadm against the BootstrapSigner (#41417, @luxas)
- Rename some flags for beta UI and fixup some logic (#42064, @luxas)
- Insecure access to the API Server at `localhost:8080` will be turned off in v1.6 when using kubeadm (#42066, @luxas)
- Flag `-use-kubernetes-version` for kubeadm init renamed to `-kubernetes-version` (#41820, @kad)
- Remove the `-cloud-provider` flag for beta init UX (#41710, @luxas)
- Fixed an SELinux issue in kubeadm on Docker 1.12+ by moving etcd

- SELinux options from container to pod. (#40682, @dgoodwin)
- Add authorization mode to kubeadm (#39846, @andrewrynhard)
- Refactor the certificate and kubeconfig code in the kubeadm binary into two phases (#39280, @luxas)
- Added kubeadm commands to manage bootstrap tokens and the duration they are valid for. (#35805, @dgoodwin)

## kubectl

### New Commands

- apply **set-last-applied** *updates the applied-applied-configuration annotation* (#41694, @shiywang)
- kubectl apply **view-last-applied** *viewing the last configuration file applied* (#41146, @shiywang)

### Create subcommands

- create **poddisruptionbudget** (#36646, @kargakis)
- create **clusterrole** (#41538, @xingzhou)
- create **role** (#39852, @xingzhou)
- create **clusterrolebinding** (#37098, @deads2k)
- create **service externalname** (#34789, @adohe)
- set selector** - update selector labels (#38966, @kargakis)
- can-i** to see if you can perform an action (#41077, @deads2k)

### Updates to existing commands

- Printing and output
  - Import a numeric ordering sorting library and use it in the sorting printer. (#40746, @matthyx)
  - DaemonSet get and describe show status fields. (#42843, @janetkuo)
  - Pods describe shows tolerationSeconds (#42162, @kevin-wangzefeng)
  - Node describe contains closing paren (#39217, @luksa)
  - Display pod node selectors with kubectl describe. (#36396, @aveshagarwal)
  - Add Version to the resource printer for 'get nodes' (#37943, @ailusazh)
  - Added support for printing in all supported **--output** formats to **kubectl create ...** and **kubectl apply ...** (#38112, @juanvallejo)
  - Add three more columns to **kubectl get deploy -o wide** output. (#39240, @xingzhou)
  - Fix kubectl get -f -o so it prints all items in the file (#39038, @ncdc)
  - kubectl describe no longer prints the last-applied-configuration annotation for secrets. (#34664, @ymqytw)
  - Completed pods should not be hidden when requested by name via **kubectl get**. (#42216, @smarterclayton)



- Improve formatting of EventSource in `kubectl get` and `kubectl describe` (#40073, @matthyx)
- Attach now supports multiple types (#40365, @shiywang)
- Create now accepts the label selector flag for filtering objects to create (#40057, @MrHohn)
- Top now accepts short forms for “node” and “pod” (“no”, “po”) (#39218, @luksa)
- Begin paths for internationalization in `kubectl` (#36802, @brendandburns)
  - Add initial french translations for `kubectl` (#40645, @brendandburns)

### Updates to apply

- New command `apply set-last-applied` *updates the applied-applied-configuration annotation* (#41694, @shiywang)
- New command `apply view-last-applied` *command for viewing the last configuration file applied* (#41146, @shiywang)
- `apply` now supports explicitly clearing values by setting them to null (#40630, @liggitt)
- Warn user when using `apply` on a resource lacking the `LastAppliedConfig` annotation (#36672, @ymqytw)
- PATCH (i.e. `apply` and `edit`) now supports merging lists of primitives (#38665, @ymqytw)
- `apply` falls back to generic 3-way JSON merge patch for Third Party Resource or unregistered types (#40666, @ymqytw)

### Updates to edit

- `edit` now supports Third party resources and extension API servers. (#41304, @liggitt)
  - Now to edit a particular API version, provide the fully-qualify the resource, version, and group used to fetch the object (for example, `job.v1.batch/myjob`)
  - Client-side conversion is no longer done, and the `--output-version` option is deprecated for `kubectl edit`.
- `edit` works as intended with `apply` and will not change the annotation
  - No longer updates the last-applied-configuration annotation when `--save-config` is unspecified or false. (#41924, @ymqytw)
  - Fixes issue that caused `apply` to revert changes made by `edit`

### Bug fixes

- Fixed `--save-config` in create subcommand to save the annotation (#40289, @xilabao)
- Fixed an issue where ‘`kubectl get --sort-by=`’ would return an error if the specified fields in sort were not specified in one or more of the returned objects. (#40541, @fabianofranz)

- Previously this would cause the command to fail regardless of whether or not the field was present in the object model
  - Now the command will succeed even if the sort-by field is missing from one or more of the objects
- Fixed issue with kubectl proxy so it will now proxy an empty path - e.g. `http://localhost:8001` (#39226, @luksa)
- Fixed an issue where commas were not accepted in `--from-literal` flags for the creation of secrets. (#35191, @SamiHiltunen)
  - Passing multiple values separated by a comma in a single `--from-literal` flag is no longer supported. Please use multiple `--from-literal` flags to provide multiple values.
- Fixed a bug where the `--server`, `--token`, and `--certificate-authority` flags were not overriding the related in-cluster configs when provided in a `kubectl` call inside a cluster. (#39006, @fabianofranz)

### Other Notable Changes

- The api server will publish the extensions/Deployments API as preferred over the apps/Deployment (introduced in 1.6). (#43553, @liggitt)
  - This will ensure certain commands in 1.5 versions of kubectl continue function when run against a 1.6 server. (e.g. `kubectl edit deployment`)
- Taint
  - The `taint` command will not function in a skewed 1.5 / 1.6 environment - client and server versions must match (See Action required section above)
  - Change taints/tolerations to api fields (#38957, @aveshagarwal)
  - Make kubectl taint command respect effect NoExecute (#42120, @kevin-wangzefeng)
- Allow drain `--force` to remove pods whose managing resource is deleted. (#41864, @marun)
- `--output-version` is ignored for all commands except `kubectl convert`. This is consistent with the generic nature of `kubectl` CRUD commands and the previous removal of `--api-version`. Specific versions can be specified in the resource field: `resource.version.group`, `jobs.v1.batch`. (#41576, @deads2k)
- Allow missing keys in templates by default (#39486, @ncdc)
- Add error message when trying to use clusterrole with namespace in kubectl (#36424, @xilabao)
- When deleting an object with `--grace-period=0`, the client will begin a graceful deletion and wait until the resource is fully deleted. To force deletion, use the `--force` flag. (#37263, @smarterclayton)

### Node Components

- Kubelet config should ignore file start with dots. (#39196, @resouer)

- Bump GCI to gci-stable-56-9000-84-2. (#41819, @dchen1107)
- Bump GCE ContainerVM to container-vm-v20170214 to address CVE-2016-9962. (#41449, @zmerlynn)
- Kubelet: Remove the PLEG health check from /healthz, Kubelet will now report
- NodeNotReady on failed PLEG health check. (#41569, @yujuhong)
- CRI: upgrade protobuf to v3. Protobuf v2 and v3 are not compatible. (#39158, @feiskyer)
- kubelet exports metrics for cgroup management (#41988, @sjenning)
- Experimental support to reserve a pod's memory request from being utilized by pods in lower QoS tiers. (#41149, @sjenning)
- Port forwarding can forward over websockets or SPDY. (#33684, @fraenkel)
- Flag gate faster evictions based on node memory pressure using kernel memcg notifications - `--experimental-kernel-memcg-notification`. (#38258, @derekwaynecarr)
- Nodes can now report two additional address types in their status: InternalDNS and ExternalDNS. The apiserver can use `--kubelet-preferred-address-types` to give priority to the type of address it uses to reach nodes. (#34259, @liggitt)

### Bug fixes

- Add image cache to fix the issue where kubelet hangs when reporting the node status. (#38375, @Random-Liu)
- Fix logic error in graceful deletion that caused pods not being able to be deleted. (#37721, @derekwaynecarr)
- Fix ConfigMap for Windows Containers. (#39373, @jbhurat)
- Fix the “pod rejected by kubelet may stay at pending forever” bug. (<https://github.com/kubernetes/kubernetes/pull/37661>), @yujuhong)

### kube-controller-manager

- add `--controllers` to controller manager (#39740, @deads2k)

### kube-dns

- Adds support for configurable DNS stub domains and upstream nameservers. The following configuration options have been added to the `kube-system:kube-dns` ConfigMap:

```
"stubDomains": {
  "acme.local": ["1.2.3.4"]
},
```

is a map of domain to list of nameservers for the domain. This is used to inject private DNS domains into the kube-dns namespace. In the above example, any DNS requests for `*.acme.local` will be served by the nameserver 1.2.3.4.

```
"upstreamNameservers": ["8.8.8.8", "8.8.4.4"]
```

is a list of upstreamNameservers to use, overriding the configuration specified in `/etc/resolv.conf`.

- An empty `kube-system:kube-dns` ConfigMap will be created for the cluster if one did not already exist.

## kube-proxy

- - **Add tcp/udp userspace proxy support for Windows.** (#41487, @anhowe)
- Add DNS suffix search list support in Windows kube-proxy. (#41618, @JiangtianLi)
- Add a KUBERNETES\_NODE\_\* section to build kubelet/kube-proxy for windows (#38919, @brendandburns)
- Remove outdated net.experimental.kubernetes.io/proxy-mode and net.beta.kubernetes.io/proxy-mode annotations from kube-proxy. (#40585, @cblecker)
- proxy/iptables: don't sync proxy rules if services map didn't change (#38996, @dcbw)
- Update kube-proxy image to be based off of Debian 8.6 base image. (#39695, @ixdy)
- Update amd64 kube-proxy base image to debian-iptables-amd64:v5 (#39725, @ixdy)
- Clean up the kube-proxy container image by removing unnecessary packages and files. (#42090, @timstclair)
- Better compat with very old iptables (e.g. CentOS 6) (#37594, @thockin)

## Scheduler

- Add the support to the scheduler for spreading pods of StatefulSets. (#41708, @bsalamat)
- Added support to minimize sending verbose node information to scheduler extender by sending only node names and expecting extenders to cache the rest of the node information (#41119, @sarat-k)
- Support KUBE\_MAX\_PD\_VOLS on Azure (#41398, @codablock)
- Mark multi-scheduler graduation to beta and then v1. (#38871, @k82cn)
- Scheduler treats StatefulSet pods as belonging to a single equivalence class. (#39718, @foxish)
- Update FitError as a message component into the PodConditionUpdater. (#39491, @jayunit100)
- Fix comment and optimize code (#38084, @tanshanshan)
- Add flag to enable contention profiling in scheduler. (#37357, @gmarek)
- Try self-repair scheduler cache or panic (#37379, @wojtekt)

## Volume Plugins

### Azure Disk

- restrict name length for Azure specifications (#40030, @colemickens)

### GlusterFS

- The glusterfs dynamic volume provisioner will now choose a unique GID for new persistent volumes from a range that can be configured in the storage class with the “gidMin” and “gidMax” parameters. The default range is 2000 - 2147483647 (max int32). (#37886, @obnoxxx)

### Photon

- Fix photon controller plugin to construct with correct PdID (#37167, @luomiao)

### rbd

- force unlock rbd image if the image is not used (#41597, @rootfs)

### vSphere

- Fix fsGroup to vSphere (#38655, @abrarshivani)
- Fix issue when attempting to unmount a wrong vSphere volume (#37413, @BaluDontu)

## Other Notable Changes

- Implement bulk polling of volumes (#41306, @gnufied)
- Check if pathExists before performing Unmount (#39311, @rkouj)
- Unmount operation should not fail if volume is already unmounted (#38547, @rkouj)
- Provide kubernetes-controller-manager flags to control volume attach/detach reconciler sync. The duration of the syncs can be controlled, and the syncs can be shut off as well. (#39551, @chrislovecnm)
- Fix unmountDevice issue caused by shared mount in GCI (#38411, @jingxu97)
- Fix permissions when using fsGroup (#37009, @sjenning)
- Fixed issues (#39202), (#41041) and (#40941) that caused the iSCSI connections to be prematurely closed when deleting a pod with an iSCSI persistent volume attached and that prevented the use of newly created LUNs on targets with preestablished connections. (#41196), @CristianPop)

## Changes to Cluster Provisioning Scripts

### AWS

- Deployment of AWS Kubernetes clusters using the in-tree bash deployment (i.e. `cluster/kube-up.sh` or `get-kube.sh`) is obsolete. v1.5.x will be the last release to support `cluster/kube-up.sh` with AWS. For a list of viable alternatives, see: <http://kubernetes.io/docs/getting-started-guides/aws/> (#42196, @zmerlynn)
- Fix an issue where AWS tear-down leaks an DHCP Option Set. (#38645, @zmerlynn)

### Juju

- The `kubernetes-master`, `kubernetes-worker` and `kubeapi-load-balancer` charms have gained an `nrpe-external-master` relation, allowing the integration of their monitoring in an external Nagios server. (#41923, @Cynerva)
- Disable anonymous auth on kubelet (#41919, @Cynerva)
- Fix shebangs in charm actions to use python3 (#42058, @Cynerva)
- K8s master charm now properly keeps distributed master files in sync for an HA control plane. (#41351, @chuckbutler)
- Improve status messages (#40691, @Cynerva)
- Splits Juju Charm layers into master/worker roles (#40324, @chuckbutler)
  - Adds support for 1.5.x series of Kubernetes
  - Introduces a tactic for keeping templates in sync with upstream eliminating template drift
  - Adds CNI support to the Juju Charms
  - Adds durable storage support to the Juju Charms
  - Introduces an e2e Charm layer for repeatable testing efforts and validation of clusters

### libvirt CoreOS

- To add local registry to `libvirt_coreos` (#36751, @sdminonne)

### GCE

- the `gce` provider enables both RBAC authorization and the permissive legacy ABAC policy that makes all service accounts superusers. To opt out of the permissive ABAC policy, export the environment variable `ENABLE_LEGACY_ABAC=false` before running `cluster/kube-up.sh`. (#43544, @liggitt)
- the `gce` provider ensures the bootstrap admin token user is included in the super-user group (#39537, @liggitt)
- Remove support for debian masters in GCE `kube-up`. (#41666, @mikedanese)

- Remove support for trusty in GCE kube-up. (#41670, @mikedanese)
- Don't fail if the grep fails to match any resources (#41933, @ixdy)
- Fix the output of health-mointor.sh (#41525, @yujuhong)
- Added configurable etcd initial-cluster-state to kube-up script. (#41332, @jszczepkowski)
- The kube-apiserver basic audit log can be enabled in GCE by exporting the environment variable `ENABLE_APISERVER_BASIC_AUDIT=true` before running `cluster/kube-up.sh`. This will log to `/var/log/kube-apiserver-audit.log` and use the same `logrotate` settings as `/var/log/kube-apiserver.log`. (#41211, @enisoc)
- On kube-up.sh clusters on GCE, kube-scheduler now contacts the API on the secured port. (#41285, @liggitt)
- Use existing ABAC policy file when upgrading GCE cluster (#40172, @liggitt)
- Ensure the GCI metadata files do not have newline at the end (#38727, @Amey-D)
- Fixed detection of master during creation of multizone nodes cluster by kube-up. (#38617, @jszczepkowski)
- Fixed validation of multizone cluster for GCE (#38695, @jszczepkowski)
- Fix GCI mounter issue (#38124, @jingxu97)
- Exit with error if is not the final parameter. (#37723, @mtaufen)
- GCI: Remove `/var/lib/docker/network` (#37593, @yujuhong)
- Fix the equality checks for numeric values in `cluster/gce/util.sh`. (#37638, @roberthbailey)
- Modify GCI mounter to enable NFSv3 (#37582, @jingxu97)
- Use `gsed` on the Mac (#37562, @roberthbailey)
- Bump GCI
- to gci-beta-56-9000-80-0 (#41027, @dchen1107)
- to gci-stable-56-9000-84-2 (#41819, @dchen1107)
- Bump GCE ContainerVM
  - to container-vm-v20161208 (release notes) (#38432, @timstclair)
  - to container-vm-v20170201 to address CVE-2016-9962. (#40828, @zmerlynn)
  - to container-vm-v20170117 to pick up CVE fixes in base image. (#40094, @zmerlynn)
  - to container-vm-v20170214 to address CVE-2016-9962. (#41449, @zmerlynn)

## OpenStack

- Do not daemonize `salt-minion` for the openstack-heat provider. (#40722, @micmro)
- OpenStack-Heat will now look for an image named “CentOS-7-x86\_64-GenericCloud-1604”. To restore the previous behavior set `OPENSTACK_IMAGE_NAME=“CentOS7”` (#40368, @sc68cal)
- Fixes a bug in the OpenStack-Heat kubernetes provider, in the handling

of differences between the Identity v2 and Identity v3 APIs (#40105, @sc68cal)

## Container Images

- Update gcr.io/google-containers/rescheduler to v0.2.2, which uses busybox as a base image instead of ubuntu. (#41911, @ixdy)
- Remove unnecessary metrics (http/process/go) from being exposed by etcd-version-monitor (#41807, @shyamjvs)
- Align the hyperkube image to support running binaries at /usr/local/bin/ like the other server images (#41017, @luxas)
- Bump up GLBC version from 0.9.0-beta to 0.9.1 (#41037, @bprashanth)

## Other Notable Changes

- The default client certificate generated by kube-up now contains the superuser `system:masters` group (#39966, @liggitt)
- Added support for creating HA clusters for centos using kube-up.sh. (#39462, @Shawyeok)
- Enable lazy inode table and journal initialization for ext3 and ext4 (#38865, @codablock)
- Since `kubernetes.tar.gz` no longer includes client or server binaries, `cluster/kube-{up,down,push}.sh` now automatically download released binaries if they are missing. (#38730, @ixdy)
- Fix broken cluster/centos and enhance the style (#34002, @xiaoping378)
- Set `kernel.softlockup_panic = 1` based on the flag. (#38001, @dchen1107)
- Configure `local-up-cluster.sh` to handle auth proxies (#36838, @deads2k)
- `kube-up.sh/kube-down.sh` no longer force update gcloud for `provider=gce|gke`. (#36292, @jlowdermilk)
- Collect logs for dead kubelets too (#37671, @mtaufen)

## Changes to Addons

### Dashboard

- Update dashboard version to v1.6.0 (#43210, @floreks)

### DNS

- Updates the dnsmasq cache/mux layer to be managed by dnsmasq-nanny. (#41826, @bowei) dnsmasq-nanny manages dnsmasq based on values from the kube-system:kube-dns configmap:

```
"stubDomains": {  
  "acme.local": ["1.2.3.4"]  
},
```



is a map of domain to list of nameservers for the domain. This is used to inject private DNS domains into the kube-dns namespace. In the above example, any DNS requests for `*.acme.local` will be served by the

```
nameserver 1.2.3.4.
```

```
upstreamNameservers": ["8.8.8.8", "8.8.4.4"]
```

is a list of upstreamNameservers to use, overriding the configuration specified in `/etc/resolv.conf`.

- `kube-dns` now runs using a separate `system:serviceaccount:kube-system:kube-dns` service account which is automatically bound to the correct RBAC permissions. (#38816, @deads2k)
- Use `kube-dns:1.11.0` (#39925, @sadril)

### DNS Autoscaler

- Patch CVE-2016-8859 in `gcr.io/google-containers/cluster-proportional-autoscaler-amd64` (#42933, @timstclair)

### Cluster Autoscaler

- Allow the Horizontal Pod Autoscaler controller to talk to the metrics API and custom metrics API as standard APIs. (#41824, @DirectXMan12)

### Cluster Load Balancing

- Update defaultbackend image to 1.3 (#42212, @timstclair)

### etcd Empty Dir Cleanup

- Base `etcd-empty-dir-cleanup` on `busybox`, run as `nobody`, and update to `etcdctl 3.0.14` (#41674, @ixdy)

### Fluentd

- Migrated `fluentd` addon to `daemon set` (#32088, @piosz)
- `Fluentd` was migrated to `Daemon Set`, which targets nodes with `beta.kubernetes.io/fluentd-ds-ready=true` label. If you use `fluentd` in your cluster please make sure that the nodes with version 1.6+ contains this label. (#42931, @piosz)
- `Fluentd-gcp` containers spawned by `DaemonSet` are now configured using `ConfigMap` (#42126, @crassirostris)
- Cleanup `fluentd-gcp` image: rebase on `debian-base`, switch to upstream packages, remove `fluent-ui` & `rails` (#41998, @timstclair)
- On GCE, the `apiserver` audit log (`/var/log/kube-apiserver-audit.log`) will be sent through `fluentd` if enabled. It will go to the same place as `kube-apiserver.log`, but tagged as its own stream. (#41360, @enisoc)

- If `experimentalCriticalPodAnnotation` feature gate is set to true, fluentd pods will not be evicted by the kubelet. (#41035, @vishh)
- fluentd config for GKE clusters updated: detect exceptions in container log streams and forward them as one log entry. (#39656, @thomasschickinger)
- Make fluentd pods critical (#39146, @crassirostris)
- Fluentd/Elasticsearch add-on: correctly parse and index kubernetes labels (#36857, @Shrugs)

## Heapster

- Bumped Heapster to v1.3.0. (#43298, @piosz)
  - More details about the release <https://github.com/kubernetes/heapster/releases/tag/v1.3.0>

## Registry

- Use daemonset in docker registry add on (#35582, @surajssd)
- contribute deis/registry-proxy as a replacement for kube-registry-proxy (#35797, @bacongobbler)

## External Dependency Version Information

Continuous integration builds have used the following versions of external dependencies, however, this is not a strong recommendation and users should consult an appropriate installation or upgrade guide before deciding what versions of etcd, docker or rkt to use.

- Docker versions 1.10.3, 1.11.2, 1.12.6 have been validated
  - Docker version 1.12.6 known issues
    - \* overlay2 driver not fully supported
    - \* live-restore not fully supported
    - \* no shared pid namespace support
  - Docker version 1.11.2 known issues
    - \* Kernel crash with Aufs storage driver on Debian Jessie (#27885) which can be identified by the node problem detector
    - \* Leaked File descriptors (#275)
    - \* Additional memory overhead per container (#21737)
  - Docker 1.10.3 contains backports provided by RedHat for known issues
  - Support for Docker version 1.9.x has been removed
- rkt version 1.23.0+
  - known issues with the rkt runtime are listed in the Getting Started Guide
- etcd version 3.0.17 ## Changelog since v1.6.0-rc.1

## Previous Releases Included in v1.6.0

- v1.6.0-rc.1

- v1.6.0-beta.4
- v1.6.0-beta.3
- v1.6.0-beta.2
- v1.6.0-beta.1
- v1.6.0-alpha.3
- v1.6.0-alpha.2
- v1.6.0-alpha.1 **No notable changes for this release**

## v1.6.0-rc.1

Documentation & Examples

### Downloads for v1.6.0-rc.1

| filename              | sha256 hash                                                     |
|-----------------------|-----------------------------------------------------------------|
| kubernetes.tar.gz     | b92be4b71184888ba4a2781d4068ea369442b6030dfb38e23029192a554651e |
| kubernetes-src.tar.gz | e45e993edfdb176a6750c6d3c2207d54d60b5b1fc80a0fe47274d4d9b233d0  |

### Client Binaries

| filename                               | sha256 hash                                                     |
|----------------------------------------|-----------------------------------------------------------------|
| kubernetes-client-darwin-386.tar.gz    | 1d56088fb85fba02362f7f87a5d5f899c05caa605f4d11b8616749cb0d97038 |
| kubernetes-client-darwin-amd64.tar.gz  | f3df7b558c2ecf6ed8344668515f436b7211a2f840d982f81c55586e1ec84a7 |
| kubernetes-client-linux-386.tar.gz     | c5ee1787d69d508d8448675428936d70e21f17b21ff44e22db4462483adcebe |
| kubernetes-client-linux-amd64.tar.gz   | 0960505da11330c8cc66b7df4e4413680afd2a62afc2341bad6bbd88c73e3a5 |
| kubernetes-client-linux-arm64.tar.gz   | dc113881b9cd09ef8cecbdf8f4ff41eddeba7df3ad7af70461e513eb79757e5 |
| kubernetes-client-linux-arm.tar.gz     | 5f6bd182852ffe3776b520fbf2db3546c8246133df166dcf6c81ece4b097422 |
| kubernetes-client-linux-ppc64le.tar.gz | ea91e79a779eac8c00a5eb80be1fd5b227b9f5ae767e30a12354bfa691f198c |
| kubernetes-client-linux-s390x.tar.gz   | 874d7410078d39b80fe07a44018f6e95655cb9e05c99ec66dea012d06633fbb |
| kubernetes-client-windows-386.tar.gz   | b02d6d8e436322294a65def8c9c576f232df9387093c4ca61e57dd3bdf184b5 |
| kubernetes-client-windows-amd64.tar.gz | 68dbf06824b3785027a85d448f9f2b9928a4092912b382e67c1579e30bb58bb |

## Server Binaries

| filename                               | sha256 hash                                                     |
|----------------------------------------|-----------------------------------------------------------------|
| kubernetes-server-linux-amd64.tar.gz   | aa9e5d1cb60c1d33d048a75003fdce9ffa0985ede3748b38b4357d961943d60 |
| kubernetes-server-linux-arm64.tar.gz   | 0343a1dead1efb8b829ab485028d2ec58ffc4aa7845b3415da5a5bb6fd8bcb1 |
| kubernetes-server-linux-arm.tar.gz     | 77a724b28e071e92113759440fdca7e12ea00c5b41a5334ce7581a0139d8f20 |
| kubernetes-server-linux-ppc64le.tar.gz | ae21bc7cced29a3c20c76dbf57262a8ea276fe120e411d950ff5267fe4b6cd5 |
| kubernetes-server-linux-s390x.tar.gz   | 424f5cd9f4aee3e53a8a760ccdc16bd7e2683913e57d56519b536bf4a98f56e |

## Changelog since v1.6.0-beta.4

### Other notable changes

- `kube-up.sh` using the `gce` provider enables both RBAC authorization and the permissive legacy ABAC policy that makes all service accounts superusers. To opt out of the permissive ABAC policy, export the environment variable `ENABLE_LEGACY_ABAC=false` before running `cluster/kube-up.sh`. (#43544, @liggitt)
- Bump CNI consumers to v0.5.1 (#43546, @calebamiles)
- The API server discovery document now prioritizes the `extensions` API group over the `apps` API group. This ensures certain commands in 1.5 versions of `kubectl` (such as `kubectl edit deployment`) continue to function against a 1.6 API. (#43553, @liggitt)
- Fix adding disks to more than one scsi adapter. (#42422, @kerneltime)
- PodSecurityPolicy authorization is correctly enforced by the PodSecurityPolicy admission plugin. (#43489, @liggitt)
- API fields that previously serialized null arrays as `null` and empty arrays as `[]` no longer distinguish between those values and always output `[]` when serializing to JSON. (#43422, @liggitt)
- Apply taint tolerations for NoExecute for all static pods. (#43116, @dchen1107)
- Bumped Heapster to v1.3.0. (#43298, @piosz)
  - More details about the release <https://github.com/kubernetes/heapster/releases/tag/v1.3.0>

## v1.6.0-beta.4

Documentation & Examples

## Downloads for v1.6.0-beta.4

| filename              | sha256 hash                                                     |
|-----------------------|-----------------------------------------------------------------|
| kubernetes.tar.gz     | 8f308a87bcc367656c777f74270a82ad6986517c28a08c7158c77b1d7954e24 |
| kubernetes-src.tar.gz | 3ba73cf27a05f78026d1cfb3a0e47c6e5e33932aefc630a0a5aa3619561bc4  |

### Client Binaries

| filename                               | sha256 hash                                                     |
|----------------------------------------|-----------------------------------------------------------------|
| kubernetes-client-darwin-386.tar.gz    | 7007e8024257fd2436c9f68ddb25383e889d58379e30a60c9bb6bffb1a6809c |
| kubernetes-client-darwin-amd64.tar.gz  | f1bc3f0c8e4c8c9e0aa2f66fffea163a5bf139d528160eb4266cd5322cf112e |
| kubernetes-client-linux-386.tar.gz     | 7ceb47d4b282b31d300aa7a81bf00eef744fb58df58d613e1ea01930287c85c |
| kubernetes-client-linux-amd64.tar.gz   | d25c73f0ebb3338fc3e674d4a667d3023d073b8bc4942eb98f1a3fc9001675e |
| kubernetes-client-linux-arm64.tar.gz   | 3d5a1188f638cddad7cd5eca0668d25f46a6a6f80641a8e9e6f3777a23af0f7 |
| kubernetes-client-linux-arm.tar.gz     | e9d40ad06385266cd993adf436270972412dd5407d436e682bddf30706fddb  |
| kubernetes-client-linux-ppc64le.tar.gz | 17f9a60eb6175e28aa0a9ba534cc0ceda24ff8ab81eaf06d04c362146f707e  |
| kubernetes-client-linux-s390x.tar.gz   | 30017ac4603bda496a125162cd956e9e874a4d04eff170972c72c8095a9f912 |
| kubernetes-client-windows-386.tar.gz   | 6165b8d0781894b36b2f2cd72d79063ce95621012cd1ca38bd7d936feeea84  |
| kubernetes-client-windows-amd64.tar.gz | ac45e5ddf44dd0a680abc5641ae1cb59ad9c7ab8d4132e3b110ebca7ed2119a |

### Server Binaries

| filename                               | sha256 hash                                                      |
|----------------------------------------|------------------------------------------------------------------|
| kubernetes-server-linux-amd64.tar.gz   | a37f0b431aea2cc7e259ddf118fd42315589236106b279de5803e2d50af0853  |
| kubernetes-server-linux-arm64.tar.gz   | e6a5c8a9e59a12df5294766a4e31e08603a041dd75bcc23f19fb7d20d8a30b9  |
| kubernetes-server-linux-arm.tar.gz     | ebe1ccf95a80a829c294fe8bb216a10a096bc7f311fb0f74b7a121772c4d238  |
| kubernetes-server-linux-ppc64le.tar.gz | 8a09baa5c2ddfbcb579a1601f76b7079dab695c1423d22a04acd039256e26355 |
| kubernetes-server-linux-s390x.tar.gz   | 621feb08ac3bee0b9f5b31c648b3011f91883c44954db04268c0da4ef59f161  |

## Changelog since v1.6.0-beta.3

### Other notable changes

- Update dashboard version to v1.6.0 (#43210, @floreks)
- Update photon controller go SDK in vendor code. (#43108, @luomiao)
- Fluentd was migrated to Daemon Set, which targets nodes with `beta.kubernetes.io/fluentd-ds-ready=true` label. If you use fluentd in your cluster please make sure that the nodes with version 1.6+ contains this label. (#42931, @piosz)
- if kube-apiserver is started with `--storage-backend=etcd2`, the media type `application/json` is used. (#43122, @liggitt)
- Add `-p` to `makedirs` in `gci-mounter` function of `gce configure.sh` script (#43134, @shyamjvs)
- Rescheduler uses taints in v1beta1 and will remove old ones (in version v1alpha1) right after its start. (#43106, @piosz)
- `kubeadm`: `kubeadm reset` won't drain and remove the current node anymore (#42713, @luxas)
- `hack/godep-restore.sh`: use `godep v79` which works (#42965, @sttts)
- Patch CVE-2016-8859 in `gcr.io/google-containers/cluster-proportional-autoscaler-amd64` (#42933, @timstclair)
- Disable `devicemapper thin_ls` due to excessive iops (#42899, @dashpole)

## v1.6.0-beta.3

Documentation & Examples

### Downloads for v1.6.0-beta.3

| filename              | sha256 hash                                                                                                                    |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------|
| kubernetes.tar.gz     | 3903f0a49945abe26f5775c20deb25ba65a8607a2944da8802255bd50d20aca62f5f9459c14163e319f878494d10296052d75345da7906e8b38a2d6d0d2a2f |
| kubernetes-src.tar.gz | 62f5f9459c14163e319f878494d10296052d75345da7906e8b38a2d6d0d2a2f                                                                |

### Client Binaries

| filename                              | sha256 hash                                                     |
|---------------------------------------|-----------------------------------------------------------------|
| kubernetes-client-darwin-386.tar.gz   | 1294256f09d3a78a05cf2c85466495b08f87830911e68fd0206964f0466682  |
| kubernetes-client-darwin-amd64.tar.gz | ff6d8561163d9039c807f4cf05144dd3837104b111fac1ae4b667e2b8548d13 |
| kubernetes-client-linux-386.tar.gz    | d32a07b4a24a88cfef589cff91336e411a89ed470557b8f74f34bb6636adc80 |
| kubernetes-client-linux-amd64.tar.gz  | e3663e134cd42bbf71f4f6f0395e6c3ea2080d8621bdab9cc668c77f5478196 |

| filename                               | sha256 hash                                                     |
|----------------------------------------|-----------------------------------------------------------------|
| kubernetes-client-linux-arm64.tar.gz   | 39465c409396a4cc0ae672f0f0c0db971e482de52e9dff835eb43a8f7e3412e |
| kubernetes-client-linux-arm.tar.gz     | 8897b38e59cee396213f50453bdc88808cd56d63be762362d79454ce526b1e  |
| kubernetes-client-linux-ppc64le.tar.gz | a32b85c5e495dd3645845f2e8ff0eb366fb4ae4795e2bdafceae97cfe71e341 |
| kubernetes-client-linux-s390x.tar.gz   | 0af4f0d7778cb67c1acc3b2f3870283e3008c6e1ea8d532c6b90b5a7f1475d1 |
| kubernetes-client-windows-386.tar.gz   | b298561b924c8c88b062759cc69b733187310a7e1af74b1b3987ed256f422b0 |
| kubernetes-client-windows-amd64.tar.gz | 42ec39178885bb06cba4002844e80948e0c9c3618bfb0a009618a3fab1797a  |

### Server Binaries

| filename                               | sha256 hash                                                     |
|----------------------------------------|-----------------------------------------------------------------|
| kubernetes-server-linux-amd64.tar.gz   | 333ea0cf5c25f65dbb5d353cac002af3fa5e6f8431e81eaba2534005164c9ce |
| kubernetes-server-linux-arm64.tar.gz   | 2979a04409863f6e4dbc745eebfd57ee90e0b38ed4449dcb15cfd87d8f80da  |
| kubernetes-server-linux-arm.tar.gz     | 2ed1e98b2566b4f552951d9496537b18b28ae53eb9e36c6fd17202e9e498ea  |
| kubernetes-server-linux-ppc64le.tar.gz | f4989351a6a98746c1d269d72d2fa87dba8ce782bdfc088d9f7f8d10029aa31 |
| kubernetes-server-linux-s390x.tar.gz   | 31fb764136e97e851d1640464154f3ce4fc696e3286314f538da7b19eed3e21 |

## Changelog since v1.6.0-beta.2

### Other notable changes

- Introduce new generator for apps/v1beta1 deployments (#42362, @soltys)
- Use Prometheus instrumentation conventions (#36704, @fabxc)
- Add new DaemonSet status fields to kubectrl printer and describer. (#42843, @janetkuo)
- Dropped the support for docker 1.9.x and the belows. (#42694, @dchen1107)

## v1.6.0-beta.2

Documentation & Examples

## Downloads for v1.6.0-beta.2

| filename              | sha256 hash                                                     |
|-----------------------|-----------------------------------------------------------------|
| kubernetes.tar.gz     | 8199c781f8c98ed7048e939a590ea10a6c39f6a74bd35ed526b459fa18e20f5 |
| kubernetes-src.tar.gz | f8de26ab6493d4547f9068f5ef396650c169702863535ba63feaf815464a670 |

## Client Binaries

| filename                               | sha256 hash                                                     |
|----------------------------------------|-----------------------------------------------------------------|
| kubernetes-client-darwin-386.tar.gz    | 0b2350c5ffec582f86d2bd95fa9ecd1b4213fbcd3af79f2a7f67d071c3a0373 |
| kubernetes-client-darwin-amd64.tar.gz  | a1c81457a34258f2622f841b9971ba490c66f6a0f5725c089430d0f0fb09dc8 |
| kubernetes-client-linux-386.tar.gz     | 40d45492f6741980afde0c83bb752382b699b3d62ac36203faca16fcd9fadd2 |
| kubernetes-client-linux-amd64.tar.gz   | a06baf31249b06375fde1f608ffea041bdbad0f4814ba8ea69839a7778fa464 |
| kubernetes-client-linux-arm64.tar.gz   | d9e18ceb7efacee5cc2a579e204919bb4c272c586bc15750963946e7fe5dc74 |
| kubernetes-client-linux-arm.tar.gz     | 7abc1a2e5c0e40b46b9839b9c9ca065fceed486413ee3c0687e832dc668560c |
| kubernetes-client-linux-ppc64le.tar.gz | 84d82f1c2a2b07bea7c827c20cc208f0741b72cf732319673edbf73b42f1b68 |
| kubernetes-client-linux-s390x.tar.gz   | 605852ee99117abb5bf62f4239c7e2c7e3976f1f497e24ffed50ba4817c301c |
| kubernetes-client-windows-386.tar.gz   | 2c442dbfaa393f67f2fe2a1fd2c10267092e99385ca40f7bed732d48bb36ae6 |
| kubernetes-client-windows-amd64.tar.gz | 6b64521cde0b239d9e23e0896919653dfe30ad064d363a9931305feefe04b35 |

## Server Binaries

| filename                               | sha256 hash                                                     |
|----------------------------------------|-----------------------------------------------------------------|
| kubernetes-server-linux-amd64.tar.gz   | 0a49f719cd295be9a4947b7b8b0fe68c29d8168d7e03a9e37173de340490b57 |
| kubernetes-server-linux-arm64.tar.gz   | fb1464794b9e6375cc7f5b8b72125d81921416b6825fe2c37073aef006e846c |
| kubernetes-server-linux-arm.tar.gz     | 27acc02302c6d45ef6314a2bceca6012e35c88d0678b219528d21d8ee4c6b42 |
| kubernetes-server-linux-ppc64le.tar.gz | 8eef21ab0700ba2802ef70d2c0b84ee0b27ae0833d2259d425429984f972690 |



| filename                             | sha256 hash                                                    |
|--------------------------------------|----------------------------------------------------------------|
| kubernetes-server-linux-s390x.tar.gz | c6e383f897ceb8143a7b1f023e155c9c39e9e7c220e989cc6c1bfcffdb886d |

## Changelog since v1.6.0-beta.1

### Action Required

- Deployment now fully respects ControllerRef to avoid fighting over Pods and ReplicaSets. At the time of upgrade, **you must not have Deployments with selectors that overlap**, or else ownership of ReplicaSets may change. (#42175, @enisoc)
- StatefulSet now respects ControllerRef to avoid fighting over Pods. At the time of upgrade, **you must not have StatefulSets with selectors that overlap** with any other controllers (such as ReplicaSets), or else ownership of Pods may change. (#42080, @enisoc)

### Other notable changes

- DaemonSet now respects ControllerRef to avoid fighting over Pods. (#42173, @enisoc)
- restored normalization of custom `--etcd-prefix` when `--storage-backend` is set to `etcd3` (#42506, @liggitt)
- kubelet created cgroups follow lowercase naming conventions (#42497, @derekwaynecarr)
- Support whitespace in command path for gcp auth plugin (#41653, @jlowdermilk)
- Updates the dnsmasq cache/mux layer to be managed by dnsmasq-nanny. (#41826, @bowei)
  - dnsmasq-nanny manages dnsmasq based on values from the kube-system:kube-dns configmap: `"stubDomains": { "acme.local": ["1.2.3.4"] }`, is a map of domain to list of nameservers for the domain. This is used to inject private DNS domains into the kube-dns namespace. In the above example, any DNS requests for `*.acme.local` will be served by the nameserver `1.2.3.4`. `"upstreamNameservers": ["8.8.8.8", "8.8.4.4"]` is a list of upstreamNameservers to use, overriding the configuration specified in `/etc/resolv.conf`.
- kubelet exports metrics for cgroup management (#41988, @sjenning)
- kubectl: respect deployment strategy parameters for rollout status (#41809, @kargakis)
- Remove cmd/kube-discovery from the tree since it's not necessary anymore (#42070, @luxas)
- kubeadm: Hook up kubeadm against the BootstrapSigner (#41417, @luxas)

- Federated Ingress over GCE no longer requires separate firewall rules to be created for each cluster to circumvent flapping firewall health checks. (#41942, @csbell)
- ScaleIO Kubernetes Volume Plugin added enabling pods to seamlessly access and use data stored on ScaleIO volumes. (#38924, @vladimirvivien)
- Pods are launched in a separate cgroup hierarchy than system services. (#42350, @vishh)
- Experimental support to reserve a pod's memory request from being utilized by pods in lower QoS tiers. (#41149, @sjenning)
- Juju: Disable anonymous auth on kubelet (#41919, @Cynerva)
- Remove support for debian masters in GCE kube-up. (#41666, @mikedanese)
- Implement bulk polling of volumes (#41306, @gnufied)
- stop kubectrl edit from updating the last-applied-configuration annotation when `--save-config` is unspecified or false. (#41924, @ymqytw)

## v1.6.0-beta.1

Documentation & Examples

### Downloads for v1.6.0-beta.1

| filename              | sha256 hash                                                     |
|-----------------------|-----------------------------------------------------------------|
| kubernetes.tar.gz     | ca17c4f1ebdd4bbbd0e570bf3a29d52be1e962742155bc5e20765434f3141f2 |
| kubernetes-src.tar.gz | 4aefc25b42594f0aab48e43608c8ef6eca8c115022fcc76a9a0d34430e33be  |

### Client Binaries

| filename                               | sha256 hash                                                     |
|----------------------------------------|-----------------------------------------------------------------|
| kubernetes-client-darwin-386.tar.gz    | 7629da89467e758e6e70c513d5332e6231941de60e99b6621376bc72f9ede3  |
| kubernetes-client-darwin-amd64.tar.gz  | 3a6d6f78ca307486189c7a92e874508233d6b9b5697a0c42cb2803f4b17ccf1 |
| kubernetes-client-linux-386.tar.gz     | 544b944fdcbabb0dbf0e1acedf7e1deb40fd795c46b8f5afe5d622d2091f0a  |
| kubernetes-client-linux-amd64.tar.gz   | d13f3bede2beb1d7fbca7f01a2c0775938d9127073b0fa1cecb4fd152947e   |
| kubernetes-client-linux-arm64.tar.gz   | 8820b18ae1c3bdcb8c93b5641e9322aa8dba25ec42362aa86ecbe6ae690a98  |
| kubernetes-client-linux-arm.tar.gz     | d928f7e772a74cf715cf382d66ba757394afcf02a03727edfe43305f279fdb  |
| kubernetes-client-linux-ppc64le.tar.gz | 56ccc3a9def527278cd41ba1ce5b0528238ef7b7b5886d6ebc944b11e2f522  |

| filename                               | sha256 hash                                                     |
|----------------------------------------|-----------------------------------------------------------------|
| kubernetes-client-linux-s390x.tar.gz   | 4923b9617b5306b321e47450bbfe701242b46b2d27800d82a7289fbabe7a107 |
| kubernetes-client-windows-386.tar.gz   | 598703591fa2be13cc47930088117fc12731431b679f8ca2a5717430bb45fb5 |
| kubernetes-client-windows-amd64.tar.gz | 9e839346effcbe9c469519002967069c8d109282aaceb72e02f25cf606a691b |

### Server Binaries

| filename                               | sha256 hash                                                     |
|----------------------------------------|-----------------------------------------------------------------|
| kubernetes-server-linux-amd64.tar.gz   | 726b9e4ead829ebd293fe6674ab334f72aa163b1544963febb9bc35d1fb26e  |
| kubernetes-server-linux-arm64.tar.gz   | 975d02629619d441f60442ca07c42721e103e9e5bbcc2eea302b7c936303d2  |
| kubernetes-server-linux-arm.tar.gz     | 98223dd80f34eed3cdb30fb57df1da96630db9c0f04aae6a685e22a29c1639  |
| kubernetes-server-linux-ppc64le.tar.gz | a73715b7db73d6d0ad0b78b01829fe9f22566b557eebe2c1a960a81693b0c8b |
| kubernetes-server-linux-s390x.tar.gz   | d3cb54e9193c773ea9998106c75bb3f0af705477fb844bcc8f82c845c44bb0  |

## Changelog since v1.6.0-alpha.3

### Action Required

- The `-dns-provider` argument of ‘kubefed init’ is now mandatory and does not default to `google-clouddns`. To initialize a Federation control plane with Google Cloud DNS, use the following invocation: ‘kubefed init `-dns-provider=google-clouddns`’ (#42092, @marun)
- Change taints/tolerations to api fields (#38957, @aveshagarwal)

### Other notable changes

- kubeadm: Rename some flags for beta UI and fixup some logic (#42064, @luxas)
- StorageClassName attribute has been added to PersistentVolume and PersistentVolumeClaim objects and should be used instead of annotation `volume.beta.kubernetes.io/storage-class`. The beta annotation is still working in this release, however it will be removed in a future release. (#42128, @jsafrane)
- Remove Azure kube-up as the Azure community has focused efforts elsewhere. (#41672, @mikedanese)

- Fluentd-gcp containers spawned by DaemonSet are now configured using ConfigMap (#42126, @Crassirostris)
- Modified kubemark startup scripts to restore master on reboot (#41980, @shyamjvs)
- Added new Api **PodPreset** to enable defining cross-cutting injection of Volumes and Environment into Pods. (#41931, @jessfraz)
- AWS cloud provider: allow to run the master with a different AWS account or even on a different cloud provider than the nodes. (#39996, @scheeles)
- Update defaultbackend image to 1.3 (#42212, @timstclair)
- Allow the Horizontal Pod Autoscaler controller to talk to the metrics API and custom metrics API as standard APIs. (#41824, @DirectXMan12)
- Implement support for mount options in PVs (#41906, @gnufied)
- Introduce apps/v1beta1.Deployments resource with modified defaults compared to extensions/v1beta1.Deployments. (#39683, @soltys)
- Add DNS suffix search list support in Windows kube-proxy. (#41618, @JiangtianLi)
- **--experimental-nvidia-gpus** flag is **replaced** by **Accelerators** alpha feature gate along with support for multiple Nvidia GPUs. (#42116, @vishh)
  - To use GPUs, pass **Accelerators=true** as part of **--feature-gates** flag.
  - Works only with Docker runtime.
- Clean up the kube-proxy container image by removing unnecessary packages and files. (#42090, @timstclair)
- AWS: Support shared tag `kubernetes.io/cluster/<clusterid>` (#41695, @justinsb)
- Insecure access to the API Server at localhost:8080 will be turned off in v1.6 when using kubeadm (#42066, @luxas)
- AWS: Do not consider master instance zones for dynamic volume creation (#41702, @justinsb)
- Added foreground garbage collection: the owner object will not be deleted until all its dependents are deleted by the garbage collector. Please checkout the user doc for details. (#38676, @caesarxuchao)
  - `deleteOptions.orphanDependents` is going to be deprecated in 1.7. Please use `deleteOptions.propagationPolicy` instead.
- force unlock rbd image if the image is not used (#41597, @rootfs)
- The kubernetes-master, kubernetes-worker and kubeapi-load-balancer charms have gained an nrpe-external-master relation, allowing the integration of their monitoring in an external Nagios server. (#41923, @Cynerva)
- make kubectl describe pod show tolerationSeconds (#42162, @kevin-wangzefeng)
- Completed pods should not be hidden when requested by name via `kubect1 get`. (#42216, @smarterclayton)
- Federation Flag cleanup (#41335, @irfanurrehman)
- Add the support to the scheduler for spreading pods of StatefulSets.

- (#41708, @bsalamat)
- Portworx Volume Plugin added enabling Portworx to be used as a storage provider for Kubernetes clusters. Portworx pools your servers capacity and turns your servers or cloud instances into converged, highly available compute and storage nodes. (#39535, @adityadani)
  - Remove support for trusty in GCE kube-up. (#41670, @mikedanese)
  - Import a natural sorting library and use it in the sorting printer. (#40746, @matthyx)
  - Parameter keys in a StorageClass `parameters` map may not use the `kubernetes.io` or `k8s.io` namespaces. (#41837, @liggitt)
  - Make DaemonSet respect critical pods annotation when scheduling. (#42028, @janetkuo)
  - New Kubelet flag `--enforce-node-allocatable` with a default value of  `pods` is added which will make kubelet create a top level cgroup for all pods to enforce Node Allocatable. Optionally, `system-reserved` & `kube-reserved` values can also be specified separated by comma to enforce node allocatable on cgroups specified via `--system-reserved-cgroup` & `--kube-reserved-cgroup` respectively. Note the default value of the latter flags are `““`. (#41234, @vishh)
    - This feature requires a **Node Drain** prior to upgrade failing which pods will be restarted if possible or terminated if they have a **RestartNever** policy.
  - Deployment of AWS Kubernetes clusters using the in-tree bash deployment (i.e. `cluster/kube-up.sh` or `get-kube.sh`) is obsolete. `v1.5.x` will be the last release to support `cluster/kube-up.sh` with AWS. For a list of viable alternatives, see: <http://kubernetes.io/docs/getting-started-guides/aws/> (#42196, @zmerlynn)
  - `kubectrl` logs allows getting logs directly from deployment, job and statefulset (#40927, @soltys)
  - make `kubectrl` taint command respect effect `NoExecute` (#42120, @kevin-wangzefeng)
  - Flex volume plugin is updated to support attach/detach interfaces. It broke backward compatibility. Please update your drivers and implement the new callouts. (#41804, @chakri-nelluri)
  - Implement the update feature for DaemonSet. (#41116, @lukaszo)
  - Federation Create configmap for the cluster kube-dns when cluster joins and remove when it unjoins (#39338, @irfanurrehman)
  - New GKE certificates controller. (#41160, @pipejakob)
  - Juju: Fix shebangs in charm actions to use python3 (#42058, @Cynerva)
  - Support `kubectrl` apply `set-last-applied` command to update the applied-applied-configuration annotation (#41694, @shiywang)
  - On GCI by default logrotate is disabled for application containers in favor of rotation mechanism provided by docker logging driver. (#40634, @Crassirostris)
  - Cleanup `fluentd-gcp` image: rebase on `debian-base`, switch to upstream packages, remove `fluent-ui` & `rails` (#41998, @timstclair)

- Updating apiserver to return http status code 202 for a delete request when the resource is not immediately deleted because of user requesting cascading deletion using `DeleteOptions.OrphanDependents=false`. (#41165, @nikhiljindal)
- Federation Support configuring dns-provider (#40528, @shashidharatd)
- Added support to minimize sending verbose node information to scheduler extender by sending only node names and expecting extenders to cache the rest of the node information (#41119, @sarat-k)
- Guaranteed admission for Critical Pods (#40952, @dashpole)
- Switch to the `node-role.kubernetes.io/master` label for marking and tainting the master node in kubeadm (#41835, @luxas)
- Allow drain `-force` to remove pods whose managing resource is deleted. (#41864, @marun)
- add `kubectl can-i` to see if you can perform an action (#41077, @deads2k)
- enable `DefaultTolerationSeconds` admission controller by default (#41815, @kevin-wangzefeng)
- Make `DaemonSets` survive taint-based evictions when nodes turn unreachable/notReady. (#41896, @kevin-wangzefeng)
- Add configurable limits to `CronJob` resource to specify how many successful and failed jobs are preserved. (#40932, @peay)
- Deprecate `outofdisk-transition-frequency` and `low-diskspace-threshold-mb` flags (#41941, @dashpole)
- Add OWNERS for sample-apiserver in staging (#42094, @sttts)
- Update `gcr.io/google-containers/rescheduler` to v0.2.2, which uses busybox as a base image instead of ubuntu. (#41911, @ixdy)
- Add `storage.k8s.io/v1` API (#40088, @jsafrane)
- Juju - K8s master charm now properly keeps distributed master files in sync for an HA control plane. (#41351, @chuckbutler)
- Fix zsh completion: unknown file attribute error (#38104, @elipapa)
- kubelet config should ignore file start with dots (#39196, @resouer)
- Add an alpha feature that makes `NodeController` set Taints instead of deleting Pods from not Ready Nodes. (#41133, @gmarek)
- Base `etcd-empty-dir-cleanup` on busybox, run as nobody, and update to `etcdctl 3.0.14` (#41674, @ixdy)
- Fix zone placement heuristics so that multiple mounts in a `StatefulSet` pod are created in the same zone (#40910, @justinsb)
- Flag `-use-kubernetes-version` for kubeadm init renamed to `-kubernetes-version` (#41820, @kad)
- `kube-dns` now runs using a separate `system:serviceaccount:kube-system:kube-dns` service account which is automatically bound to the correct RBAC permissions. (#38816, @deads2k)
- [Kubemark] Fixed hollow-`npd` container command to log to file (#41858, @shyamjvs)
- kubeadm: Remove the `-cloud-provider` flag for beta init UX (#41710, @luxas)
- The `CertificateSigningRequest` API added the `extra` field to persist all

- information about the requesting user. This mirrors the fields in the SubjectAccessReview API used to check authorization. (#41755, @liggitt)
- Upgrade golang versions to 1.7.5 (#41771, @cblecker)
  - Added a new secret type “bootstrap.kubernetes.io/token” for dynamically creating TLS bootstrapping bearer tokens. (#41281, @ericchiang)
  - Remove unnecessary metrics (http/process/go) from being exposed by etcd-version-monitor (#41807, @shyamjvs)
  - Added `kubectl create clusterrole` command. (#41538, @xingzhou)
  - Support new `kubectl apply view-last-applied` command for viewing the last configuration file applied (#41146, @shiywang)
  - Bump GCI to gci-stable-56-9000-84-2 (#41819, @dchen1107)
  - `list-resources`: don’t fail if the `grep` fails to match any resources (#41933, @ixdy)
  - `client-go` no longer imports GCP OAuth2 and OpenID Connect packages by default. (#41532, @ericchiang)
  - Each pod has its own associated `cgroup` by default. (#41349, @derekwaynecarr)
  - Whitelist `kubemark` in `node_ssh_supported_providers` for log dump (#41800, @shyamjvs)
  - Support `KUBE_MAX_PD_VOLS` on Azure (#41398, @codablock)
  - Projected volume plugin (#37237, @jpeeler)
  - `--output-version` is ignored for all commands except `kubectl convert`. This is consistent with the generic nature of `kubectl` CRUD commands and the previous removal of `--api-version`. Specific versions can be specified in the resource field: `resource.version.group, jobs.v1.batch`. (#41576, @deads2k)
  - Added `bool` type support for `jsonpath`. (#39063, @xingzhou)
  - Nodes can now report two additional address types in their status: `InternalDNS` and `ExternalDNS`. The `apiserver` can use `--kubelet-preferred-address-types` to give priority to the type of address it uses to reach nodes. (#34259, @liggitt)
  - Clients now use the `?watch=true` parameter to make watch API calls, instead of the `/watch/` path prefix (#41722, @liggitt)
  - `ResourceQuota` ability to support default limited resources (#36765, @derekwaynecarr)
  - Fix `kubemark` default `e2e` test suite’s name (#41751, @shyamjvs)
  - `federation aws`: add logging of `route53` calls (#39964, @justinsb)
  - Fix `ConfigMap` for `Windows Containers`. (#39373, @jbhurat)
  - add `defaultTolerationSeconds` admission controller (#41414, @kevinwangzefeng)
  - `Node Problem Detector` is beta now. New features added: `journald` support, `standalone` mode and arbitrary system log monitoring. (#40206, @Random-Liu)
  - Fix the output of `health-mointor.sh` (#41525, @yujuhong)
  - `kubectl describe` no longer prints the last-applied-configuration annotation for secrets. (#34664, @ymqytw)

- Report node not ready on failed PLEG health check (#41569, @yujuhong)
- Delay Deletion of a Pod until volumes are cleaned up (#41456, @dashpole)
- Alpha version of dynamic volume provisioning is removed in this release. Annotation (#40000, @jsafrane)
  - “volume.alpha.kubernetes.io/storage-class” does not have any special meaning. A default storage class and DefaultStorageClass admission plugin can be used to preserve similar behavior of Kubernetes cluster, see <https://kubernetes.io/docs/user-guide/persistent-volumes/#class-1> for details.
- An `automountServiceAccountToken *bool` field was added to ServiceAccount and PodSpec objects. If set to `false` on a pod spec, no service account token is automounted in the pod. If set to `false` on a service account, no service account token is automounted for that service account unless explicitly overridden in the pod spec. (#37953, @liggitt)
- Bump addon-manager version to v6.4-alpha.1 in kubemark (#41506, @shyamjvs)
- Do not daemonize `salt-minion` for the openstack-heat provider. (#40722, @micmro)
- Move private key parsing from serviceaccount/jwt.go to client-go/util/cert (#40907, @cblecker)
- Added configurable etcd initial-cluster-state to kube-up script. (#41332, @jszczepkowski)

## v1.6.0-alpha.3

Documentation & Examples

### Downloads for v1.6.0-alpha.3

| filename              | sha256 hash                                                     |
|-----------------------|-----------------------------------------------------------------|
| kubernetes.tar.gz     | 41b5e9edd973cbb8e68eb5d8d758c4f0afa11dfbd65df49e1c361206706a97a |
| kubernetes-src.tar.gz | ec13e22322c85752918c23b0b498ba02087a1227b8fdc169f19acdf128f907c |

### Client Binaries

| filename                              | sha256 hash                                                     |
|---------------------------------------|-----------------------------------------------------------------|
| kubernetes-client-darwin-386.tar.gz   | 5a631b7604a69ef13c27b43e6df10f8bf14ff9170440fb07d0c46bc88a5a1ea |
| kubernetes-client-darwin-amd64.tar.gz | cfba71e38a924b783fcdbc0b1a342671d52af3588a8211e35048e9c071ed03b |
| kubernetes-client-linux-386.tar.gz    | ceeee264b12959cb2b314efa9df4c165ea1598b8824ec652eb3994096f4ec07 |



| filename                               | sha256 hash                                                     |
|----------------------------------------|-----------------------------------------------------------------|
| kubernetes-client-linux-amd64.tar.gz   | 1bd3a4b64ab1535780f18b3e7a56dd1301a8ea8d66869ee704f66985c1fca9b |
| kubernetes-client-linux-arm64.tar.gz   | d1615b3223c6e83422ed8409fc8d0a7a6069982d3413a482e12966b953520f6 |
| kubernetes-client-linux-arm.tar.gz     | 19133867e2d104db3e01212dbc4a702a315310a10e86076b6b80a16b94cf795 |
| kubernetes-client-linux-ppc64le.tar.gz | 0f89e17eb881c7db39195bc94874e3ec54866d2f57eef1540b5d843bedbe432 |
| kubernetes-client-linux-s390x.tar.gz   | 3ed06cb89ffec011e4248c14d9e1c88c815b7363d1fdb217ed17e900f29960  |
| kubernetes-client-windows-386.tar.gz   | 87927cbe26cefa296e2752075d018a58826bc7fa141c4cbe56116a254a3470c |
| kubernetes-client-windows-amd64.tar.gz | e97e7dafbf670140d3c4879a6738b970ac77d917861df3eea0c502238dd297b |

## Server Binaries

| filename                               | sha256 hash                                                     |
|----------------------------------------|-----------------------------------------------------------------|
| kubernetes-server-linux-amd64.tar.gz   | 3aa82b838be450ce8dedbebfda45c453864c15aae6363ae5f1c0b0d285ffad2 |
| kubernetes-server-linux-arm64.tar.gz   | 0bdeac3524ab7ef366f3bb75e2fbff3db156dcba2b862e8b2de393e4ec4377c |
| kubernetes-server-linux-arm.tar.gz     | 1f37886aba4027ec682afe5f02a4d66a6645af2476f2954933c1b437ec66da1 |
| kubernetes-server-linux-ppc64le.tar.gz | eb81d3cdd703790d5c96e24917183dc123aeabbe9a291c2dd86c68d21d9fd23 |
| kubernetes-server-linux-s390x.tar.gz   | a50a57c689583f97fd4ff7af766bf7ae79c9fd97e46720bc41f385f2c51e1f5 |

## Changelog since v1.6.0-alpha.2

### Other notable changes

- Fix AWS device allocator to only use valid device names (#41455, @gnufied)
- Federation Bug fix relating kubeconfig path in kubefed init (#41410, @irfanurrehman)
- The apiserver audit log (/var/log/kube-apiserver-audit.log) will be sent through fluentd if enabled. (#41360, @enisoc)
- Bump GCE ContainerVM to container-vm-v20170214 to address CVE-2016-9962. (#41449, @zmerlynn)
- Fixed issues #39202, #41041 and #40941 that caused the iSCSI connections to be prematurely closed when deleting a pod with an iSCSI

- persistent volume attached and that prevented the use of newly created LUNs on targets with preestablished connections. (#41196, @CristianPop)
- The kube-apiserver basic audit log can be enabled in GCE by exporting the environment variable `ENABLE_APISERVER_BASIC_AUDIT=true` before running `cluster/kube-up.sh`. This will log to `/var/log/kube-apiserver-audit.log` and use the same `logrotate` settings as `/var/log/kube-apiserver.log`. (#41211, @enisoc)
  - On `kube-up.sh` clusters on GCE, kube-scheduler now contacts the API on the secured port. (#41285, @liggitt)
  - Default RBAC ClusterRole and ClusterRoleBinding objects are automatically updated at server start to add missing permissions and subjects (extra permissions and subjects are left in place). To prevent autoupdating a particular role or rolebinding, annotate it with `rbac.authorization.kubernetes.io/autoupdate=false`. (#41155, @liggitt)
  - Make EnableCRI default to true (#41378, @yujuhong)
  - `kubectl edit` now edits objects exactly as they were retrieved from the API. This allows using `kubectl edit` with third-party resources and extension API servers. Because client-side conversion is no longer done, the `--output-version` option is deprecated for `kubectl edit`. To edit using a particular API version, fully-qualify the resource, version, and group used to fetch the object (for example, `job.v1.batch/myjob`) (#41304, @liggitt)
  - We change the default `attach_detach_controller` sync period to 1 minute to reduce the query frequency through cloud provider to check whether volumes are attached or not. (#41363, @jingxu97)
  - RBAC `v1beta1` RoleBinding/ClusterRoleBinding subjects changed `apiVersion` to `apiGroup` to fully-qualify a subject. ServiceAccount subjects default to an apiGroup of "", User and Group subjects default to an apiGroup of `"rbac.authorization.k8s.io"`. (#41184, @liggitt)
  - Add support for finalizers in federated configmaps (deletes configmaps from underlying clusters). (#40464, @csbell)
  - Make DaemonSet controller respect node taints and pod tolerations. (#41172, @janetkuo)
  - Added `kubectl create role` command (#39852, @xingzhou)
  - If `experimentalCriticalPodAnnotation` feature gate is set to true, fluentd pods will not be evicted by the kubelet. (#41035, @vishh)

## v1.6.0-alpha.2

Documentation & Examples

## Downloads for v1.6.0-alpha.2

| filename              | sha256 hash                                                     |
|-----------------------|-----------------------------------------------------------------|
| kubernetes.tar.gz     | d1a5c7bc435c0f58dca9eab54e8155b6e4797d4b5d6b0cb8feab968dd313210 |
| kubernetes-src.tar.gz | 8d09b973f3debfe3d10b0ad392e56141446bc0d04aac60df6d761189997d97e |

## Client Binaries

| filename                               | sha256 hash                                                      |
|----------------------------------------|------------------------------------------------------------------|
| kubernetes-client-darwin-386.tar.gz    | b1a7d002768fff8282f8873fde6a0ed215d20fd72197d8e583c024b7cbbe3eb  |
| kubernetes-client-darwin-amd64.tar.gz  | b0f872bbefdc1ecc9585dfdeb9c7e094f7a16ebbe4db11c64c70d1ef7f93e3e  |
| kubernetes-client-linux-386.tar.gz     | 53be6adde2d13058d03d0f283ca166bb495cc49cd2e36339696dc46f85f78c8  |
| kubernetes-client-linux-amd64.tar.gz   | 6436463d51ed54b50023cd725b054fd2b039e391095d8a618e91979fc55d4ee  |
| kubernetes-client-linux-arm64.tar.gz   | d6638c8950a9e03ed64c3f3e1ad82166642c02aeb8f7fb2079db1f137170a14  |
| kubernetes-client-linux-arm.tar.gz     | 05d0e466a27fc9a5b6535cbd7683e08739cd37aa2c6213c000fdaa305e4eb88  |
| kubernetes-client-linux-ppc64le.tar.gz | 38971be682cbf1f194eeb9ad683272a58042f4f91992db6fc34720de28d88dc  |
| kubernetes-client-linux-s390x.tar.gz   | 774a002482d6b62338550b20d90b914a08481965ed1b78cd348535d90f88f34  |
| kubernetes-client-windows-386.tar.gz   | 690ab995ac27c90c811578677fb8688d43198499bfc451a2f908ad7a76474ee  |
| kubernetes-client-windows-amd64.tar.gz | 757fe9e2083e2da706b52c96da34548aa72bbbbbff50bb261c1198c80b36189c |

## Server Binaries

| filename                               | sha256 hash                                                     |
|----------------------------------------|-----------------------------------------------------------------|
| kubernetes-server-linux-amd64.tar.gz   | 5aa3161a1030ddb02985171d4343a99d14ad6e09e130549b20fc96797588ff1 |
| kubernetes-server-linux-arm64.tar.gz   | babce8c402c8e88310ba82315f758e981d4cfe20dcbf3047e55b279d5d4f3a3 |
| kubernetes-server-linux-arm.tar.gz     | 4b1d4c4ba95d86481d32daf09e769f7f9e4e0d71e11d39a5a4e205804b02317 |
| kubernetes-server-linux-ppc64le.tar.gz | 070423e62a0dff7ef17e29a63ac2eda5a46b6e1badf67214c07970b83610bf6 |
| kubernetes-server-linux-s390x.tar.gz   | 3a826fef775819a4f03e7db91684db6edfdaaad3e3eb366c4321bdc5ec0b0f2 |

## Changelog since v1.6.0-alpha.1

### Other notable changes

- Align the hyperkube image to support running binaries at `/usr/local/bin/` like the other server images (#41017, @luxas)
- Native support for token based bootstrap flow. This includes signing a well known ConfigMap in the `kube-public` namespace and cleaning out expired tokens. (#36101, @jbeda)
- Reverts to looking up the current VM in vSphere using the machine's UUID, either obtained via sysfs or via the `vm-uuid` parameter in the cloud configuration file. (#40892, @robdaemon)
- This PR adds a manager to NodeController that is responsible for removing Pods from Nodes tainted with NoExecute Taints. This feature is beta (as the rest of taints) and enabled by default. It's gated by controller-manager `enable-taint-manager` flag. (#40355, @gmarek)
- The authentication.k8s.io API group was promoted to v1 (#41058, @liggitt)
- Fixes issue #38418 which, under circumstance, could cause StatefulSet to deadlock. (#40838, @kow3ns)
  - Mediates issue #36859. StatefulSet only acts on Pods whose identity matches the StatefulSet, providing a partial mediation for overlapping controllers.
- Introduces an new alpha version of the Horizontal Pod Autoscaler including expanded support for specifying metrics. (#36033, @DirectXMan12)
- Set all node conditions to Unknown when node is unreachable (#36592, @andrewsykim)
- Federation Add override flags options to kubefed init (#40917, @irfanur-rehman)
- Fix for detach volume when node is not present/ powered off (#40118, @BaluDontu)
- Bump up GLBC version from 0.9.0-beta to 0.9.1 (#41037, @bprashanth)
- The deprecated flags `-config`, `-auth-path`, `-resource-container`, and `-system-container` were removed. (#40048, @mtaufen)
- Add `kubectl attach` support for multiple types (#40365, @shiywang)
- [Kubelet] Delay deletion of pod from the API server until volumes are deleted (#41095, @dashpole)
- remove the `create-external-load-balancer` flag in `cmd/expose.go` (#38183, @tianshapjq)
- The authorization.k8s.io API group was promoted to v1 (#40709, @liggitt)
- Bump GCI to gci-beta-56-9000-80-0 (#41027, @dchen1107)
- Federation Add option to expose federation apiserver on nodeport service (#40516, @shashidharatd)
- Rename `-experimental-cgroups-per-qos` to `-cgroups-per-qos` (#39972, @derekwaynecarr)
- PV E2E: provide each spec with a fresh nfs host (#40879, @copejon)
- Remove the temporary fix for pre-1.0 mirror pods (#40877, @yujuhong)

- fix `--save-config` in `create` subcommand (#40289, @xilabao)
- We should mention the caveats of in-place upgrade in release note. (#40727, @Random-Liu)
- The `SubjectAccessReview` API passes subresource and resource name information to the authorizer to answer authorization queries. (#40935, @liggitt)
- When feature gate “`ExperimentalCriticalPodAnnotation`” is set, Kubelet will avoid evicting pods in “`kube-system`” namespace that contains a special annotation - `scheduler.alpha.kubernetes.io/critical-pod` (#40655, @vishh)
  - This feature should be used in conjunction with the rescheduler to guarantee availability for critical system pods - <https://kubernetes.io/docs/admin/rescheduler/>
- make tolerations respect wildcard key (#39914, @kevin-wangzefeng)
- Federation Add option to disable persistence storage for etcd (#40862, @shashidharatd)
- Init containers have graduated to GA and now appear as a field. The beta annotation value will still be respected and overrides the field value. (#38382, @hodovska)
- apply falls back to generic 3-way JSON merge patch if no go struct is registered for the target GVK (#40666, @ymqytw)
- `HorizontalPodAutoscaler` is no longer supported in `extensions/v1beta1` version. Use `autoscaling/v1` instead. (#35782, @piosz)
- Port forwarding can forward over websockets or SPDY. (#33684, @fraenkel)
- Improve `kubect`l describe node output by adding closing paren (#39217, @luksa)
- Bump GCE `ContainerVM` to `container-vm-v20170201` to address CVE-2016-9962. (#40828, @zmerlynn)
- Use full package path for definition name in OpenAPI spec (#40124, @mbohlool)
- `kubect`l apply now supports explicitly clearing values not present in the config by setting them to null (#40630, @liggitt)
- Fixed an issue where ‘`kubect`l get `--sort-by=`’ would return an error when the specified field were not present in at least one of the returned objects, even that being a valid field in the object model. (#40541, @fabianofranz)
- Add initial french translations for `kubect`l (#40645, @brendandburns)
- `OpenStack-Heat` will now look for an image named “`CentOS-7-x86_64-GenericCloud-1604`”. To restore the previous behavior set `OPENSTACK_IMAGE_NAME=“CentOS7”` (#40368, @sc68cal)
- Preventing nil pointer reference in `client_config` (#40508, @vjsamuel)
- The bash AWS deployment via `kube-up.sh` has been deprecated. See <http://kubernetes.io/docs/getting-started-guides/aws/> for alternatives. (#38772, @zmerlynn)
- Fix failing load balancers in Azure (#40405, @codablock)
- `kubefed init` creates a service account for federation controller manager in the `federation-system` namespace and binds that service account to the `federation-system:federation-controller-manager` role that has read

and list access on secrets in the federation-system namespace. (#40392, @madhusudancs)

- Fixed an SELinux issue in kubeadm on Docker 1.12+ by moving etcd SELinux options from container to pod. (#40682, @dgoodwin)
- Juju kubernetes-master charm: improve status messages (#40691, @Cynerva)

## v1.6.0-alpha.1

Documentation & Examples

### Downloads for v1.6.0-alpha.1

| filename              | sha256 hash                                                     |
|-----------------------|-----------------------------------------------------------------|
| kubernetes.tar.gz     | abda73bc2a27ae16c66a5aea9e96cd59486ed8cf994afc55da35a3cea2edc10 |
| kubernetes-src.tar.gz | b429579ba83f9a3fa80e72ceb65b046659b17f16a0b7f70105e7096a441f32b |

### Client Binaries

| filename                               | sha256 hash                                                     |
|----------------------------------------|-----------------------------------------------------------------|
| kubernetes-client-darwin-386.tar.gz    | d5b8adee6169515324f4f420e65e9d4e14cca3402f58ec99660a1947fd79d3e |
| kubernetes-client-darwin-amd64.tar.gz  | 6232a7e46b2cbd1e30a1f44c9b424448c5def11f5132c742bf62bac8a4f26fa |
| kubernetes-client-linux-386.tar.gz     | 2974ed14b76885947c95b3c86fb8585aa08ccefe8cc11cd202dcc3cb8fcc0d1 |
| kubernetes-client-linux-amd64.tar.gz   | 3bcb40f4aa3a295ec23fe42a5e17b081ef8de174b7dfa03cb89c27a00ac16f5 |
| kubernetes-client-linux-arm64.tar.gz   | f9a55bcb6af2a415d24d69ae919c56968f6b02369675fd7def63acbde653443 |
| kubernetes-client-linux-arm.tar.gz     | b0bd7070eab2f19b9bc1840fb4da5307c7ce274f2e28f76f94c714aa08f087b |
| kubernetes-client-linux-ppc64le.tar.gz | 39f38972f93f64542ae325d9c937c9d527968bc0830fdd38dd38dc246b6f0c5 |
| kubernetes-client-linux-s390x.tar.gz   | 032e21fe0000333f36e29ddf24e207cfd6c92cb9a6d69cc0123c31aacd12338 |
| kubernetes-client-windows-386.tar.gz   | 84b7d58012760111067ec0907070cc2f6d4c95893e771533a9b335cc8d8c72b |
| kubernetes-client-windows-amd64.tar.gz | e9ce76f48a4cf58b261aec38f076ed3b61c444c55c123f30099c1d1763d6192 |

## Server Binaries

| filename                               | sha256 hash                                                     |
|----------------------------------------|-----------------------------------------------------------------|
| kubernetes-server-linux-amd64.tar.gz   | fafa4b93a522b9e73b6c31e42d32dc5eb3fccb5ca1548425da03726b48a1917 |
| kubernetes-server-linux-arm64.tar.gz   | f00f4874785d1c9cba4fd262e8086aa693027649da44b0eec69e96951e01392 |
| kubernetes-server-linux-arm.tar.gz     | e843a6357e0a2e441277e6b32d8d64a6b6fe367c3d223edec781c21d8b379a  |
| kubernetes-server-linux-ppc64le.tar.gz | 12b73f7cc4928543eee09af91d632bcf5c4ed56c44d48d62d0087c7fcbba3e0 |
| kubernetes-server-linux-s390x.tar.gz   | aad15f260d166c2b295921468837efe4a51cb7a04bcaccb3faecc9b5979861e |

## Changelog since v1.5.0

### Action Required

- Promote certificates.k8s.io to beta and enable it by default. Users using the alpha certificates API should delete v1alpha1 CSRs from the API before upgrading and recreate them as v1beta1 CSR after upgrading. (#39772, @mikedanese)
- Switch default etcd version to 3.0.14. (#36229, @wojtek-t)
  - Switch default storage backend flag in apiserver to **etcd3** mode.
- RBAC's special handling of the user **\*** in RoleBinding and ClusterRoleBinding objects is deprecated and will be removed in v1beta1. To match all users, explicitly bind to the group **system:authenticated** and/or **system:unauthenticated**. Existing v1alpha1 bindings to the user **\*** will be automatically converted to the group **system:authenticated**. (#38981, @liggitt)
- The 'endpoints.beta.kubernetes.io/hostnames-map' annotation is no longer supported. Users can use the 'Endpoints.subsets[].addresses[].hostname' field instead. (#39284, @bowei)
- **federation/deploy/deploy.sh** was an interim solution introduced in Kubernetes v1.4 to simplify the federation control plane deployment experience. Now that we have **kubefed**, we are deprecating **deploy.sh** scripts. (#38902, @madhusudancs)
- Cluster federation servers have changed the location in etcd where federated services are stored, so existing federated services must be deleted and recreated. Before upgrading, export all federated services from the federation server and delete the services. After upgrading the cluster, recreate the federated services from the exported data. (#37770, @enj)
- etcd2: watching from 0 returns all initial states as ADDED events (#38079, @hongchaodeng)

## Other notable changes

- kube-up.sh on GCE now includes the bootstrap admin in the super-user group, and ensures the auth token file is correct on upgrades (#39537, @liggitt)
- genericapiserver: cut off more dependencies – episode 3 (#40426, @sttts)
- Adding vmdk file extension for vmDiskPath in vsphere DeleteVolume (#40538, @divyenpatel)
- Remove outdated net.experimental.kubernetes.io/proxy-mode and net.beta.kubernetes.io/proxy-mode annotations from kube-proxy. (#40585, @cblecker)
- Improve the ARM builds and make hyperkube on ARM working again by upgrading the Go version for ARM to go1.8beta2 (#38926, @luxas)
- Prevent hotloops on error conditions, which could fill up the disk faster than log rotation can free space. (#40497, @lavalamp)
- DaemonSet controller actively kills failed pods (to recreate them) (#40330, @janetkuo)
- forgiveness alpha version api definition (#39469, @kevin-wangzefeng)
- Bump up glbc version to 0.9.0-beta.1 (#40565, @bprashanth)
- Improve formatting of EventSource in kubectl get and kubectl describe (#40073, @matthyx)
- CRI: use more gogoprotobuf plugins (#40397, @yujuhong)
- Adds `shortNames` to the `APIResource` from discovery which is a list of recommended shortNames for clients like `kubectl`. (#40312, @p0lyn0mial)
- Use existing ABAC policy file when upgrading GCE cluster (#40172, @liggitt)
- Added support for creating HA clusters for centos using kube-up.sh. (#39462, @Shawyeok)
- azure: fix Azure Container Registry integration (#40142, @colemickens)
- – Splits Juju Charm layers into master/worker roles (#40324, @chuck-butler)
  - \* Adds support for 1.5.x series of Kubernetes
  - \* Introduces a tactic for keeping templates in sync with upstream eliminating template drift
  - \* Adds CNI support to the Juju Charms
  - \* Adds durable storage support to the Juju Charms
  - \* Introduces an e2e Charm layer for repeatable testing efforts and validation of clusters



- genericapiserver: more dependency cutoffs (#40216, @sttts)
- AWS: trust region if found from AWS metadata (#38880, @justinsb)
- Volumes and environment variables populated from ConfigMap and Secret objects can now tolerate the named source object or specific keys being missing, by adding `optional: true` to the volume or environment variable source specifications. (#39981, @fraenkel)
- kubectl create now accepts the label selector flag for filtering objects to create (#40057, @MrHohn)
- A new field `terminationMessagePolicy` has been added to containers that allows a user to request `FallbackToLogsOnError`, which will read from the container's logs to populate the termination message if the user does not write to the termination message log file. The termination message file is now properly readable for end users and has a maximum size (4k bytes) to prevent abuse. Each pod may have up to 12k bytes of termination messages before the contents of each will be truncated. (#39341, @smarterclayton)
- Add a special purpose tool for editing individual fields in a ConfigMap with kubectl (#38445, @brendandburns)
- Federation Expose autoscaling apis through federation api server (#38976, @irfanurrehman)
- Powershell script to start kubelet and kube-proxy (#36250, @jbhurat)
- Reduce time needed to attach Azure disks (#40066, @codablock)
- fixing Cassandra shutdown example to avoid data corruption (#39199, @deimosfr)
- kubeadm: add optional self-hosted deployment for apiserver, controller-manager and scheduler. (#40075, @pires)
- kubelet tears down pod volumes on pod termination rather than pod deletion (#37228, @sjenning)
- The default client certificate generated by kube-up now contains the superuser `system:masters` group (#39966, @liggitt)
- CRI: upgrade protobuf to v3 (#39158, @feiskyer)
- Add SIGCHLD handler to pause container (#36853, @verb)
- Populate environment variables from a secrets. (#39446, @fraenkel)
- fluentd config for GKE clusters updated: detect exceptions in container log streams and forward them as one log entry. (#39656, @thomasschickinger)
- Made multi-scheduler graduated to Beta and then v1. (#38871, @k82cn)
- Fixed forming resolver search line for pods: exclude duplicates, obey libc limitations, logging and eventing appropriately. (#29666, @vefimova)

- Add authorization mode to kubeadm (#39846, @andrewrynhard)
- Update dependencies: aws-sdk-go to 1.6.10; also cadvisor (#40095, @dashpole)
- Fixes a bug in the OpenStack-Heat kubernetes provider, in the handling of differences between the Identity v2 and Identity v3 APIs (#40105, @sc68cal)
- Update GCE ContainerVM deployment to container-vm-v20170117 to pick up CVE fixes in base image. (#40094, @zmerlynn)
- AWS: Remove duplicate calls to DescribeInstance during volume operations (#39842, @gnufied)
- The `attributeRestrictions` field has been removed from the PolicyRule type in the rbac.authorization.k8s.io/v1alpha1 API. The field was not used by the RBAC authorizer. (#39625, @deads2k)
- Enable lazy inode table and journal initialization for ext3 and ext4 (#38865, @codablock)
- azure disk: restrict name length for Azure specifications (#40030, @colemickens)
- Follow redirects for streaming requests (exec/attach/port-forward) in the apiserver by default (alpha -> beta). (#40039, @timstclair)
- Use kube-dns:1.11.0 (#39925, @sadlil)
- Anonymous authentication is now automatically disabled if the API server is started with the AlwaysAllow authorizer. (#38706, @deads2k)
- genericapiserver: cut off kube pkg/version dependency (#39943, @sttts)
- genericapiserver: cut off pkg/serviceaccount dependency (#39945, @sttts)
- Move pkg/api/rest into genericapiserver (#39948, @sttts)
- genericapiserver: cut off pkg/apis/extensions and pkg/storage dependencies (#39946, @sttts)
- genericapiserver: cut off certificates api dependency (#39947, @sttts)
- Admission control support for versioned configuration files (#39109, @derekwaynecarr)
- Fix issue around merging lists of primitives when using PATCH or kubectl apply. (#38665, @ymqytw)
- Fixes API compatibility issue with empty lists incorrectly returning a null `items` field instead of an empty array. (#39834, @liggitt)
- scheduling Moved pod affinity and anti-affinity from annotations to api fields #25319 (#39478, @rrati)

- PodSecurityPolicy resource is now enabled by default in the extensions API group. (#39743, @pweil-)
- add `--controllers` to controller manager (#39740, @deads2k)
- proxy/iptables: don't sync proxy rules if services map didn't change (#38996, @dcbw)
- Update amd64 kube-proxy base image to debian-iptables-amd64:v5 (#39725, @ixdy)
- Update dashboard version to v1.5.1 (#39662, @rf232)
- Fix kubectrl get -f -o so it prints all items in the file (#39038, @ncdc)
- Scheduler treats StatefulSet pods as belonging to a single equivalence class. (#39718, @foxish)
- `--basic-auth-file` supports optionally specifying groups in the fourth column of the file (#39651, @liggitt)
- To create or update an RBAC RoleBinding or ClusterRoleBinding object, a user must: (#39383, @liggitt)
  - Be authorized to make the create or update API request
  - Be allowed to bind the referenced role, either by already having all of the permissions contained in the referenced role, or by having the `bind` permission on the referenced role.
- Fixes an HPA-related panic due to division-by-zero. (#39694, @DirectX-Man12)
- federation: Adding support for DeleteOptions.OrphanDependents for federated services. Setting it to false while deleting a federated service also deletes the corresponding services from all registered clusters. (#36390, @nikhiljindal)
- Update kube-proxy image to be based off of Debian 8.6 base image. (#39695, @ixdy)
- Update FitError as a message component into the PodConditionUpdater. (#39491, @jayunit100)
- rename kubernetes-discovery to kube-aggregator (#39619, @deads2k)
- Allow missing keys in templates by default (#39486, @ncdc)
- Caching added to the OIDC client auth plugin to fix races and reduce the time kubectrl commands using this plugin take by several seconds. (#38167, @ericchiang)
- AWS: recognize eu-west-2 region (#38746, @justinsb)

- Provide kubernetes-controller-manager flags to control volume attach/detach reconciler sync. The duration of the syncs can be controlled, and the syncs can be shut off as well. (#39551, @chrislovecnm)
- Generate OpenAPI definition for inlined types (#39466, @mbohlool)
- ShortcutExpander has been extended in a way that it will examine a ha... (#38835, @p0lyn0mial)
- fixes nil dereference when doing a volume type check on persistent volumes (#39493, @sjenning)
- Fix issue with PodDisruptionBudgets in which `minAvailable` specified as a percentage did not work with StatefulSet Pods. (#39454, @foxish)
- fix issue with kubectl proxy so that it will proxy an empty path - e.g. `http://localhost:8001` (#39226, @luksa)
- Check if pathExists before performing Unmount (#39311, @rkouj)
- Adding kubectl tests for federation (#38844, @nikhiljindal)
- Fix comment and optimize code (#38084, @tanshanshan)
- When using OIDC authentication and specifying `-oidc-username-claim=email`, an `"email_verified":true` claim must be returned from the identity provider. (#36087, @ericchiang)
- Allow pods to define multiple environment variables from a whole ConfigMap (#36245, @fraenkel)
- Refactor the certificate and kubeconfig code in the kubeadm binary into two phases (#39280, @luxas)
- Added support for printing in all supported `--output` formats to `kubectl create ...` and `kubectl apply ...` (#38112, @juanvallejo)
- genericapiserver: extract CA cert from server cert and SNI cert chains (#39022, @sttts)
- Endpoints, that tolerate unready Pods, are now listing Pods in state Terminating as well (#37093, @simonswine)
- DaemonSet ObservedGeneration (#39157, @lukaszo)
- The `--reconcile-cidr` kubelet flag was removed since it had been deprecated since v1.5 (#39322, @luxas)
- Add ready replicas in Deployments (#37959, @kargakis)
- Remove all MAINTAINER statements in Dockerfiles in the codebase as they are deprecated by docker (#38927, @luxas)
- Remove the deprecated vsphere kube-up. (#39140, @kerneltime)

- Kubectl top now also accepts short forms for “node” and “pod” (“no”, “po”) (#39218, @luksa)
- Remove ‘exec’ network plugin - use CNI instead (#39254, @freehan)
- Add three more columns to `kubectl get deploy -o wide` output. (#39240, @xingzhou)
- Add path exist check in `getPodVolumePathListFromDisk` (#38909, @jingxu97)
- Begin paths for internationalization in kubectl (#36802, @brendandburns)
- Fixes an issue where commas were not accepted in `--from-literal` flags when creating secrets. Passing multiple values separated by a comma in a single `--from-literal` flag is no longer supported. Please use multiple `--from-literal` flags to provide multiple values. (#35191, @SamiHiltunen)
- Support loading UTF16 files if a byte-order-mark is present (#39008, @brendandburns)
- Fix fsGroup to vSphere (#38655, @abrarshivani)
- ReplicaSet has owner ref of the Deployment that created it (#35676, @krmayankk)
- Don’t evict static pods (#39059, @bprashanth)
- Fixed a bug where the `--server`, `--token`, and `--certificate-authority` flags were not overriding the related in-cluster configs when provided in a `kubectl` call inside a cluster. (#39006, @fabianofranz)
- Make fluentd pods critical (#39146, @Crassirostris)
- assign -998 as the `oom_score_adj` for critical pods (e.g. kube-proxy) (#39114, @dchen1107)
- delete continue in `monitorNodeStatus` (#38798, @NickrenREN)
- add create rolebinding (#38991, @deads2k)
- Add new command “kubectl set selector” (#38966, @kargakis)
- Federation: Add `batch/jobs` API objects to federation-apiserver (#35943, @jianhuiz)
- ABAC policies using `"user": "*" or "group": "*"` to match all users or groups will only match authenticated requests. To match unauthenticated requests, ABAC policies must explicitly specify `"group": "system:unauthenticated"` (#38968, @ligitt)
- To add local registry to `libvirt_coreos` (#36751, @sdminonne)
- Add a `KUBERNETES_NODE_*` section to build kubelet/kube-proxy for windows (#38919, @brendandburns)

- Added kubeadm commands to manage bootstrap tokens and the duration they are valid for. (#35805, @dgoodwin)
- AWS: Recognize ca-central-1 region (#38410, @justinsb)
- Unmount operation should not fail if volume is already unmounted (#38547, @rkouj)
- Changed default scsi controller type in vSphere Cloud Provider (#38426, @abrarshivani)
- Move non-generic apiserver code out of the generic packages (#38191, @sttts)
- Remove extensions/v1beta1 Jobs resource, and job/v1beta1 generator. (#38614, @soltys)
- Admit critical pods in the kubelet (#38836, @bprashanth)
- Use daemonset in docker registry add on (#35582, @surajssd)
- Node affinity has moved from annotations to api fields in the pod spec. Node affinity that is defined in the annotations will be ignored. (#37299, @rrati)
- Since `kubernetes.tar.gz` no longer includes client or server binaries, `cluster/kube-{up,down,push}.sh` now automatically download released binaries if they are missing. (#38730, @ixdy)
- genericapiserver: turn APIContainer.SecretRoutes into a real ServeMux (#38826, @sttts)
- Migrated fluentd addon to daemon set (#32088, @piosz)
- AWS: Add sequential allocator for device names. (#38818, @jsafrane)
- Add 'X-Content-Type-Options: nosniff' to some error messages (#37190, @brendandburns)
- Display pod node selectors with `kubectl describe`. (#36396, @aveshagarwal)
- The main repository does not keep multiple releases of clientsets anymore. Please find previous releases at <https://github.com/kubernetes/client-go> (#38154, @caesarxuchao)
- Remove a release-note on multiple OpenAPI specs (#38732, @mbohlool)
- genericapiserver: unify swagger and openapi in config (#38690, @sttts)
- fix connection upgrades through kubernetes-discovery (#38724, @deads2k)
- Fixes bug in resolving client-requested API versions (#38533, @DirectX-Man12)
- apiserver(s): Replace `glog.Fatals` with `fmt.Errorf` (#38175, @sttts)

- Remove Azure Subnet RouteTable check (#38334, @mogthesprog)
- Ensure the GCI metadata files do not have newline at the end (#38727, @Amey-D)
- Significantly speed-up make (#38700, @sttts)
- add QoS pod status field (#37968, @sjenning)
- Fixed validation of multizone cluster for GCE (#38695, @jszczepkowski)
- Fixed detection of master during creation of multizone nodes cluster by kube-up. (#38617, @jszczepkowski)
- Update CHANGELOG.md to warn about anon auth flag (#38675, @eric-tune)
- Fixes NotAuthenticated errors that appear in the kubelet and kube-controller-manager due to never logging in to vSphere (#36169, @robdaemon)
- Fix an issue where AWS tear-down leaks an DHCP Option Set. (#38645, @zmerlynn)
- Issue a warning when using `kubectl apply` on a resource lacking the `LastAppliedConfig` annotation (#36672, @ymqytw)
- Re-add /healthz/ping handler in genericapiserver (#38603, @sttts)
- Fail kubelet if runtime is unresponsive for 30 seconds (#38527, @derekwaynecarr)
- Add support for Azure Container Registry, update Azure dependencies (#37783, @brendandburns)
- Fix panic in vSphere cloud provider (#38423, @BaluDontu)
- fix broken cluster/centos and enhance the style (#34002, @xiaoping378)
- Ability to quota storage by storage class (#34554, @derekwaynecarr)
- [Part 2] Adding s390x cross-compilation support for gcr.io images in this repo (#36050, @gajju26)
- `kubectl run -rm` no longer prints “pod xxx deleted” (#38429, @duglin)
- Bump GCE debian image to container-vm-v20161208 (release notes) (#38432, @timstclair)
- Kubelet: Add image cache. (#38375, @Random-Liu)
- Allow a selector when retrieving logs (#32752, @fraenkel)
- Fix `unmountDevice` issue caused by shared mount in GCI (#38411, @jingxu97)

- Federation Implement dry run support in kubefed init (#36447, @irfanur-rehman)
- Fix space issue in volumePath with vSphere Cloud Provider (#38338, @BaluDontu)
- Federation Make federation etcd PVC size configurable (#36310, @irfanur-rehman)
- Allow no ports when exposing headless service (#32811, @fraenkel)
- Wait for the port to be ready before starting (#38260, @fraenkel)
- Add Version to the resource printer for 'get nodes' (#37943, @ailusazh)
- contribute deis/registry-proxy as a replacement for kube-registry-proxy (#35797, @bacongobbler)
- [Part 1] Add support for cross-compiling s390x binaries (#37092, @gajju26)
- kernel memcg notification enabled via experimental flag (#38258, @derek-waynecarr)
- fix permissions when using fsGroup (#37009, @sjenning)
- Pipe get options to storage (#37693, @wojtek-t)
- add a configuration for kubelet to register as a node with taints (#31647, @mikedanese)
- Remove genericapiserver.Options.MasterServiceNamespace (#38186, @sttts)
- The `--long-running-request-regex` flag to kube-apiserver is deprecated and will be removed in a future release. Long-running requests are now detected based on specific verbs (watch, proxy) or subresources (proxy, portforward, log, exec, attach). (#38119, @liggitt)
- Better compat with very old iptables (e.g. CentOS 6) (#37594, @thockin)
- Fix GCI mounter issue (#38124, @jingxu97)
- Kubelet will no longer set hairpin mode on every interface on the machine when an error occurs in setting up hairpin for a specific interface. (#36990, @bboreham)
- fix mesos unit tests (#38196, @deads2k)
- Add `--controllers` flag to federation controller manager for enable/disable federation ingress controller (#36643, @kzwang)
- Allow backendpools in Azure Load Balancers which are not owned by cloud provider (#36882, @codablock)
- remove rbac super user (#38121, @deads2k)



- API server have two separate limits for read-only and mutating inflight requests. (#36064, @gmarek)
- check the value of min and max in kubectrl (#37789, @yarntime)
- The glusterfs dynamic volume provisioner will now choose a unique GID for new persistent volumes from a range that can be configured in the storage class with the “gidMin” and “gidMax” parameters. The default range is 2000 - 2147483647 (max int32). (#37886, @obnoxxx)
- Add kubectrl create poddisruptionbudget command (#36646, @kargakis)
- Set kernel.softlockup\_panic =1 based on the flag. (#38001, @dchen1107)
- portforwardtester: avoid data loss during send+close+exit (#37103, @sttts)
- Enable containerized mounter only for nfs and glusterfs types (#37990, @jingxu97)
- Add flag to enable contention profiling in scheduler. (#37357, @gmarek)
- Add kubernetes-anywhere as a new e2e deployment option (#37019, @pipejakob)
- add create clusterrolebinding command (#37098, @deads2k)
- kubectrl create service externalname (#34789, @AdoHe)
- Fix logic error in graceful deletion (#37721, @derekwaynecarr)
- Exit with error if is not the final parameter. (#37723, @mtaufen)
- Fix Service Update on LoadBalancerSourceRanges Field (#37720, @freehan)
- Bug fix. Incoming UDP packets not reach newly deployed services (#32561, @zreigz)
- GCI: Remove /var/lib/docker/network (#37593, @yujuhong)
- configure local-up-cluster.sh to handle auth proxies (#36838, @deads2k)
- Add `clusterid`, an optional parameter to storageclass. (#36437, @humblec)
- local-up-cluster: avoid sudo for control plane (#37443, @sttts)
- Add error message when trying to use clusterrole with namespace in kubectrl (#36424, @xilabao)
- `kube-up.sh/kube-down.sh` no longer force update gcloud for provider=gce|gke. (#36292, @jlowdermilk)
- Fix issue when attempting to unmount a wrong vSphere volume (#37413, @BaluDontu)

- Fix the equality checks for numeric values in cluster/gce/util.sh. (#37638, @roberthbailey)
- kubelet: don't reject pods without adding them to the pod manager (#37661, @yujuhong)
- Modify GCI mounter to enable NFSv3 (#37582, @jingxu97)
- Fix photon controller plugin to construct with correct PdID (#37167, @luomiao)
- Collect logs for dead kubelets too (#37671, @mtaufen)
- Set Dashboard UI version to v1.5.0 (#37684, @rf232)
- When deleting an object with `--grace-period=0`, the client will begin a graceful deletion and wait until the resource is fully deleted. To force deletion, use the `--force` flag. (#37263, @smarterclayton)
- federation service controller: stop deleting services from underlying clusters when federated service is deleted. (#37353, @nikhiljindal)
- Fix nil pointer dereference in test framework (#37583, @mtaufen)
- Kubernetes now automatically installs a StorageClass object when deployed on (#31617, @jsafrane)
  - AWS, Google Compute Engine, Google Container Engine, and OpenStack using
  - the default kube-up.sh scripts. This StorageClass is marked as default so that
  - a PersistentVolumeClaim without a StorageClass annotation now results in
  - automatic provisioning of storage (GCE PersistentDisk on Google Cloud, AWS
  - EBS on AWS, and Cinder on OpenStack). In previous versions of Kubernetes
  - a PersistentVolumeClaim without a StorageClass annotation on these cloud
  - platforms would be satisfied by manually-created PersistentVolume objects.
  - Administrators can choose to disable this behavior by deleting the automatically
  - installed StorageClass API object. Alternatively, administrators may choose to
  - keep the automatically installed StorageClass and only disable the defaulting
  - behavior by removing the “is-default-class” annotation from the StorageClass
  - API object.

- Fix TestServiceAlloc flakes (#37487, @wojtek-t)
- Use gsed on the Mac (#37562, @roberthbailey)
- Try self-repair scheduler cache or panic (#37379, @wojtek-t)
- Fluentd/Elasticsearch add-on: correctly parse and index kubernetes labels (#36857, @Shrugs)
- Mention overflows when mistakenly call function FromInt (#36487, @xialonglee)
- Update doc for kubectl apply (#37397, @ymqytw)
- Removes shorthand flag -w from kubectl apply (#37345, @MrHohn)
- Curating Owners: pkg/api (#36525, @apelisse)
- Reduce verbosity of volume reconciler when attaching volumes (#36900, @codablock)
- Federated Ingress Proposal (#29793, @quinton-hoole)

Please see the Releases Page for older releases.

Release notes of older releases can be found in: - CHANGELOG-1.2.md - CHANGELOG-1.3.md - CHANGELOG-1.4.md - CHANGELOG-1.5.md