Microsoft

Microsoft Analytics Platform System

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Agenda

- What is APS?
- APS Hardware
- Availability
- Configuration
- Networking
- External Dependencies
- Appliance Updates

Regions, Workloads & Clusters

What is APS?

- APS is the new name for Microsoft's appliance
- Rename reflects new capabilities
- Not just limited to data warehouse workloads
- Positions the appliance for integrated analytics
- APS zones the appliance

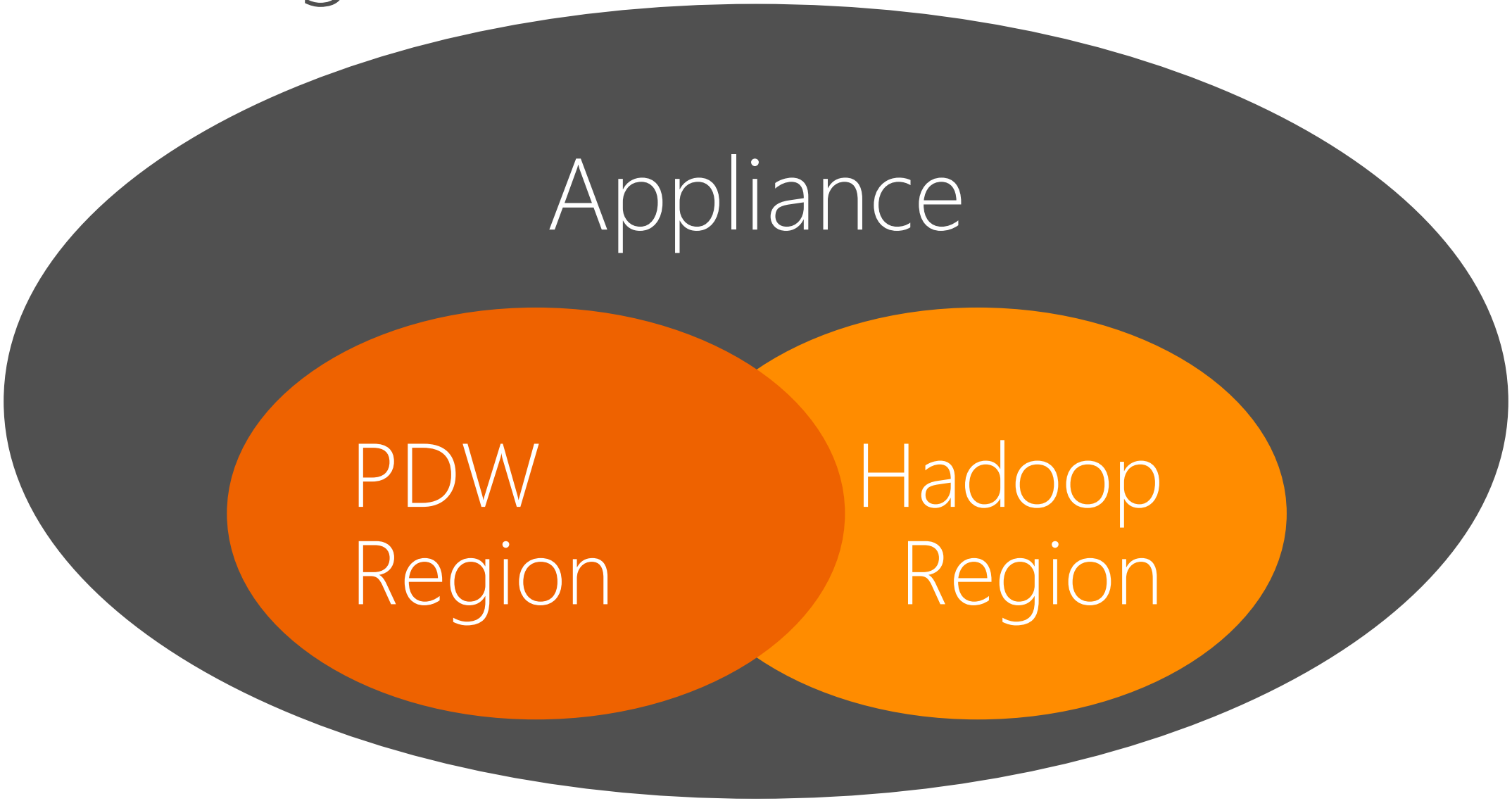
What is a Region?

Logical container within APS

Provides following boundaries:

- Workload
- Security
- Metering
- Servicing

APS Regions



What's in the PDW Region?

- Infrastructure for the appliance
- Distributed database engine (MPP)
- Hadoop data integration (PolyBase)
- Management Console

What's in the Hadoop Region?

- HDInsight
- Hortonworks Data Platform 1.3
- Developer Dashboard

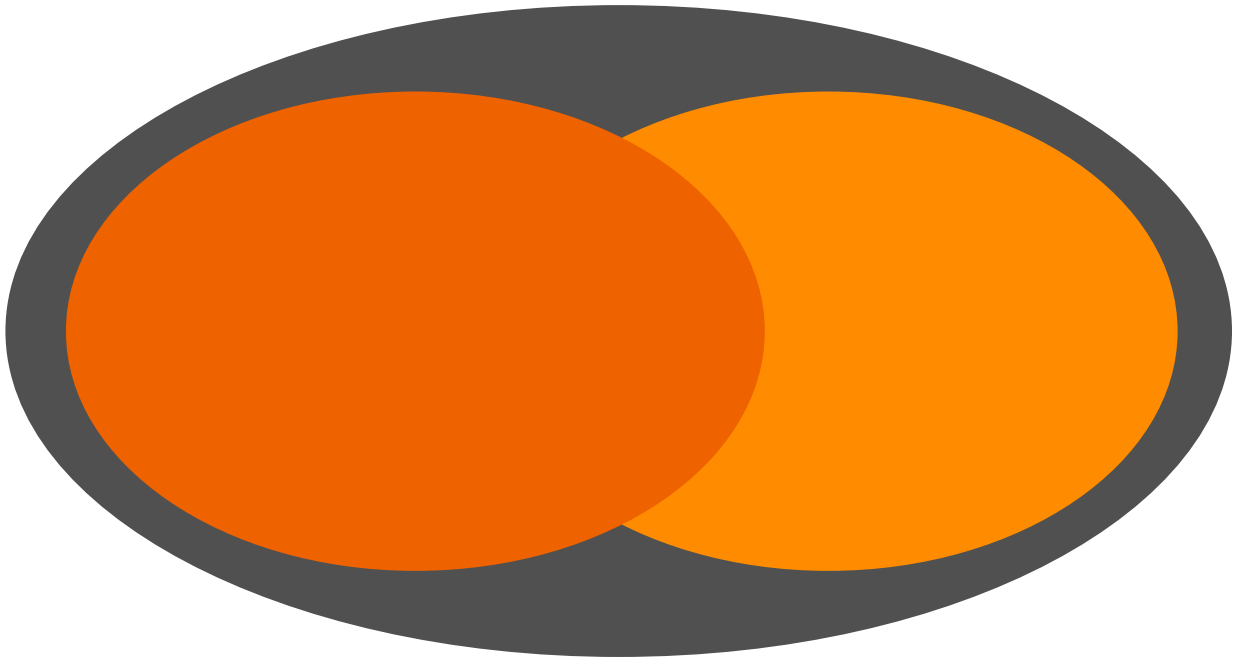
Why Do The Regions Overlap?

Hadoop Region depends on PDW Region

- Active Directory for hardware
- Management
- Licensing

No PDW Region?

- No Hadoop Region
- PDW only is OK



What is a Workload?

In physical terms it is a cluster

In AU1 each region supports one cluster

Data processing pattern

- Data warehouse
- Analytics
- Transactional processing

APS supports the following workloads

- Data warehouse
- Analytics

APPLIANCE

PDW Region

WFC

VMM

AD

CTL01

MAD01

CMP01

CMP02

CMP03

CMP04

CMP05

CMP06

Hadoop Region

WFC

HMN01

HHN01

HSN01

HDN001

HDN003

HDN005

HDN002

HDN004

HDN006

HDN007

HDN009

HDN011

HDN008

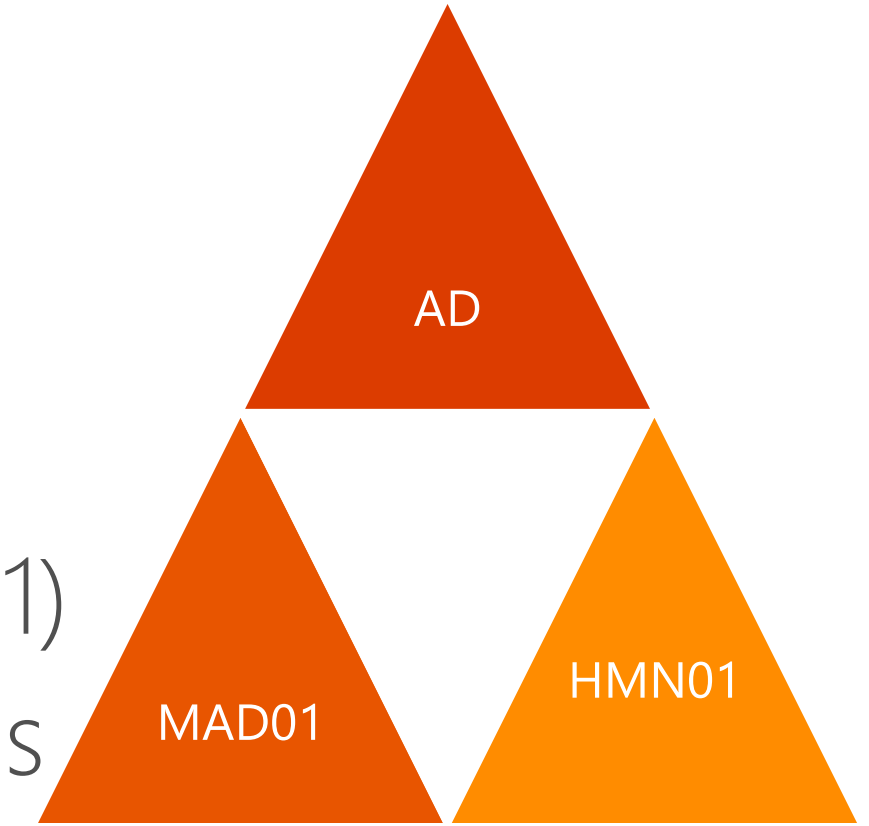
HDN010

HDN012

APS Domain Structure

3 separate internal domains

- Fabric domain (AD)
- PDW Region domain (MAD01)
- Hadoop Region domain (HMN01)
- Two way trusts between domains
- Customer domain trusts PDW Region domain



APS Hardware Components

APS Components

Rack & Network

- Ethernet switches
- InfiniBand switches

PDW Base Scale Unit

- Orchestration host
- Passive host
- Optional passive host
- Data scale unit

HDI Base Scale Unit

- Orchestration host
- Passive host
- Data scale unit

Data Scale Unit

- Data hosts
- Direct Attach Storage (DAS)

Rack & Network

Contains

- Rack
- Ethernet Switches (2)
- InfiniBand Switches (2)

Also added

- Power Units (PDU)

Orchestration Host

- Included in PDW and HDI Base Scale Unit
- Brain for PDW and HDI
- Hosts PDW Control & Management VMs
- Hosts HDInsight Name Node & Mgmt VMs

The Orchestration Server is an active server in the cluster

By default all VMs that aren't persisting data will reside on this host

Passive Host

Required for 4 cases:

- Minimal PDW Region
- Increase the availability of PDW Region
- Extending PDW into a new rack
- HDI Region

Data Scale Unit

- Unit of growth
- Used for either region
- Connects into existing switches provided by base / extended base units
- Scale Unit may consist of > 1 set of data hosts

Contains

- Data hosts
- Direct attach storage

PDW Base Scale Unit

- Smallest PDW Region
- Always required
- Contains fabric AD
- Requires full licensing for PDW
- Includes unlimited HDInsight licensing

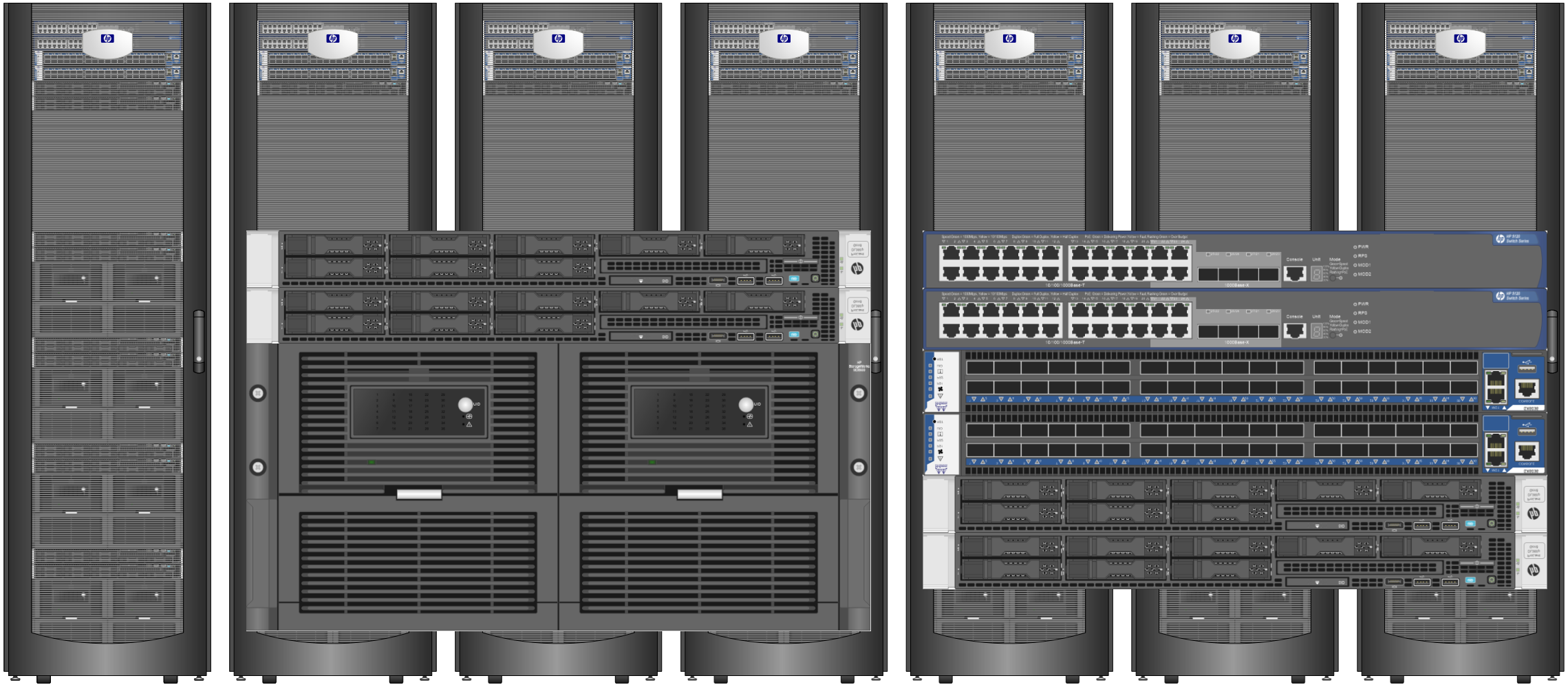
Contains

- Orchestration host
- Passive host
- Optional 2nd Passive host
- Data scale unit

APS Smallest Configuration

- Rack & Network
- PDW Base Scale Unit

PDW Region Growth Topology (HP)



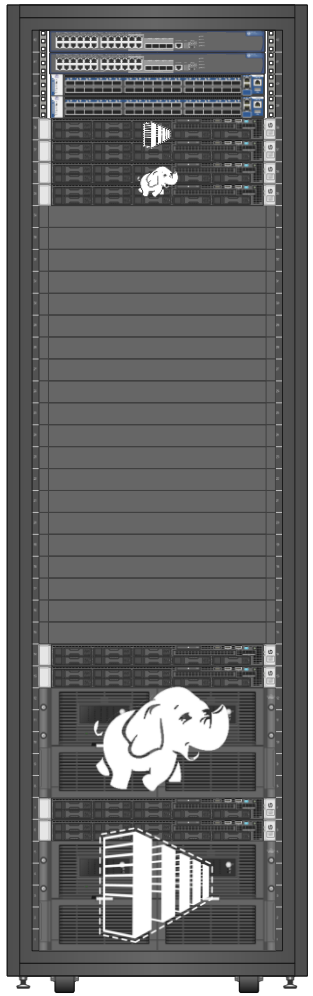
Adding the Hadoop Region

- Needs additional hardware for Hadoop brain
- PDW Region must also exist in appliance

HDI Base Scale Unit Contains

- Orchestration host
- Passive host
- One or more Data Scale Units

Growth Topologies Hadoop Region



Growth Topologies Hadoop Region

Extend

High Availability

Key Architectural Components #1

Storage Spaces

- RAID 1 mirroring for all disk volumes in PDW
- RAID 1 mirroring for some disk volumes in Hadoop

Cluster Shared Volumes

- Expose disk volumes to all nodes in the cluster

Windows Failover Clustering

- PDW & Hadoop regions are separate clusters
- Maximum 64 nodes in a WFC cluster
- Corralling Service – special cluster resource

Key Architectural Components #2

Virtualisation

- Deployed via System Center 2012 SP1 VMM
- VMs are roles in the cluster
- No live migration/ replicas/ snapshots
- VMs re-started on a passive node

Windows Failover Clusters

- Virtual machines also use WFC
- All VMs fail to a single passive host
- Used for managing networking & monitoring of services

Region Clusters #1

Nodes

- All servers in region (Active & Passive)

Failover

- ISCSI VMs do not failover
- PDW Compute VMs cannot ever fail to HST01 (HST02+)
- Hadoop Data Nodes do not failover
- No auto failback

Region Clusters #2

Roles

- Corralling Service
- Virtual Machines

Storage Pools

- One pool per DAS
- Cluster Shared Volumes (CSVs) mapped to host
- Volumes available to VM via mount points

PDW Single Node Clusters

VMs operating as single node clusters

- CTL01
- CMP01-CMPnn

Resources Managed

- Cluster Network
- SQL Server
- DMS
- PDW Engine (CTL01)

Hadoop Single Node Clusters

All VMs operate as single node clusters

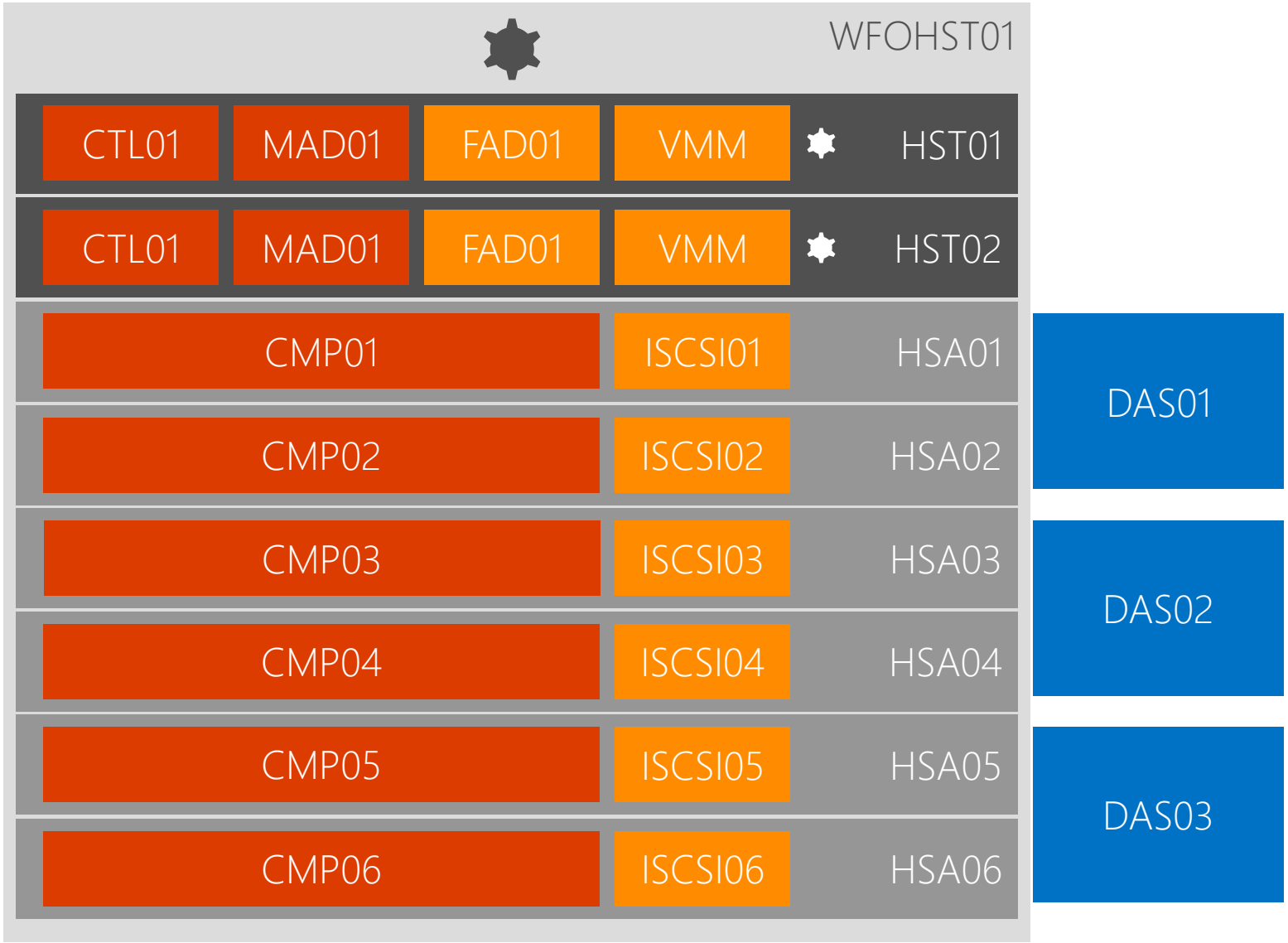
- HHN01
- HSN01
- HMN01
- HDN001-HDNnnn

Resources Managed

- Cluster Network
- HDI Web App (HSN)
- HDI Services (HN)
- HDI Services (DN)

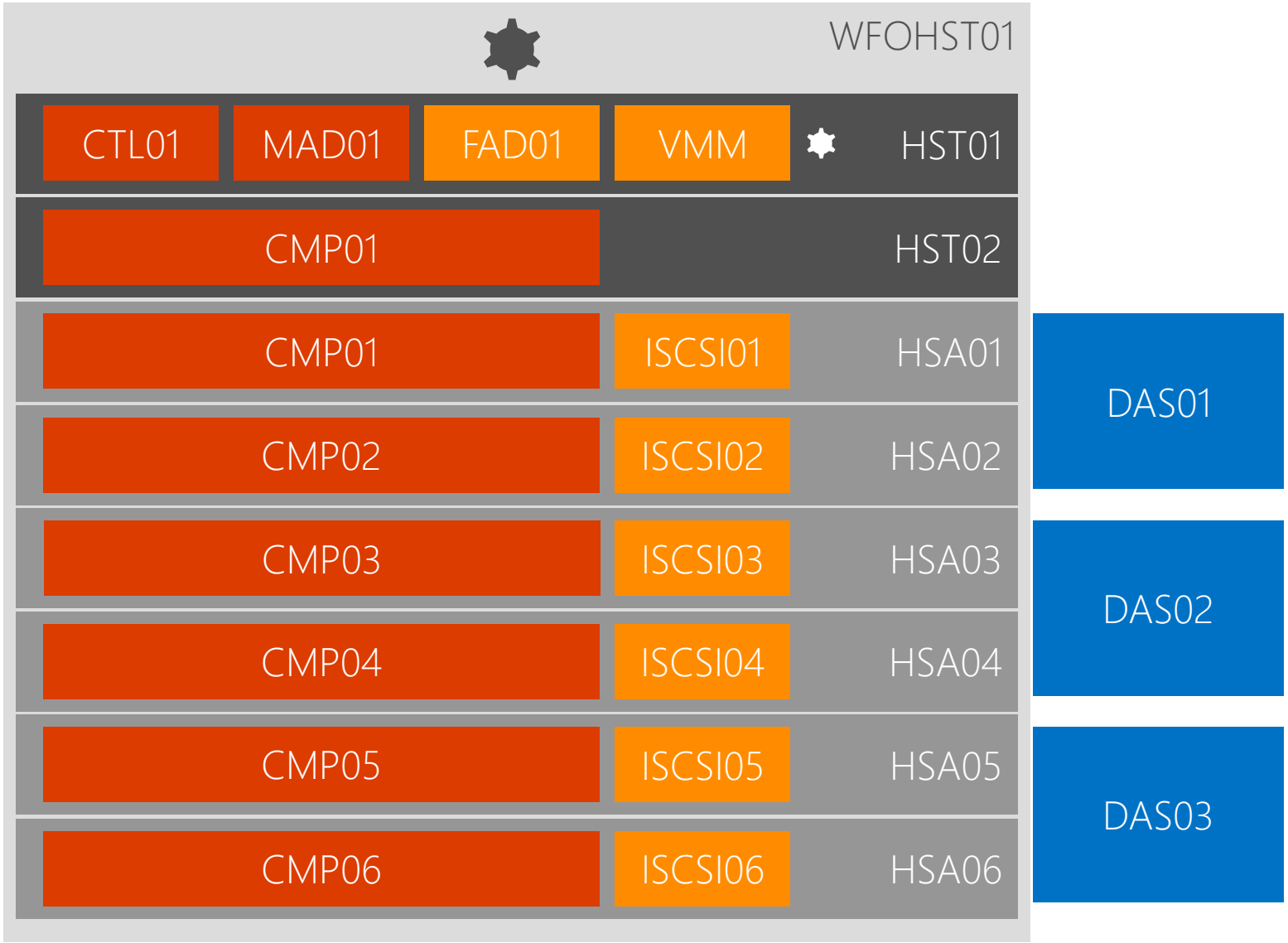
Control Node Failure

- CTL01 node fails
- Corralling service detects failure & marked as failed
- Cluster fails Corralling service to HST02
- Corralling service stops and starts VMs in the following order
  - Fabric Active Directory (FAD01)
  - Management node (MAD01)
  - Control node (CTL01)
  - VM Manager (VMM)



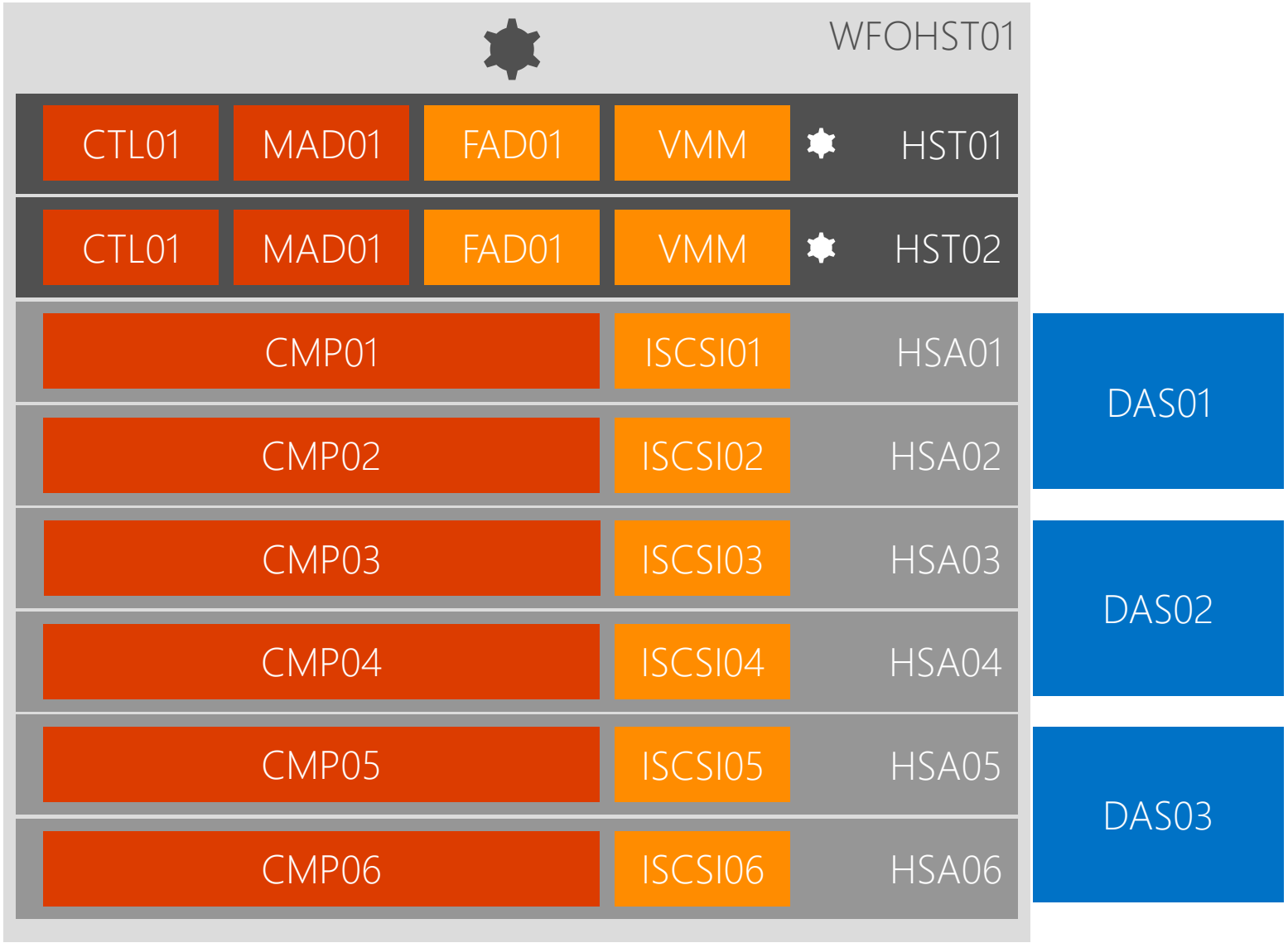
Compute Node Failure

- Compute node marked as failed
- PDW cluster restarts Compute node on a passive server
- ISCSI VM does not fail over



Orchestration Host Failure

- HST01 node fails
- Corralling service marked as failed
- Cluster fails corralling service to HST02
- Corralling service stops and starts VMs in the following order
  - Fabric Active Directory (FAD01)
  - Management (MAD01)
  - Control (CTL01)
  - VM Manager (VMM)

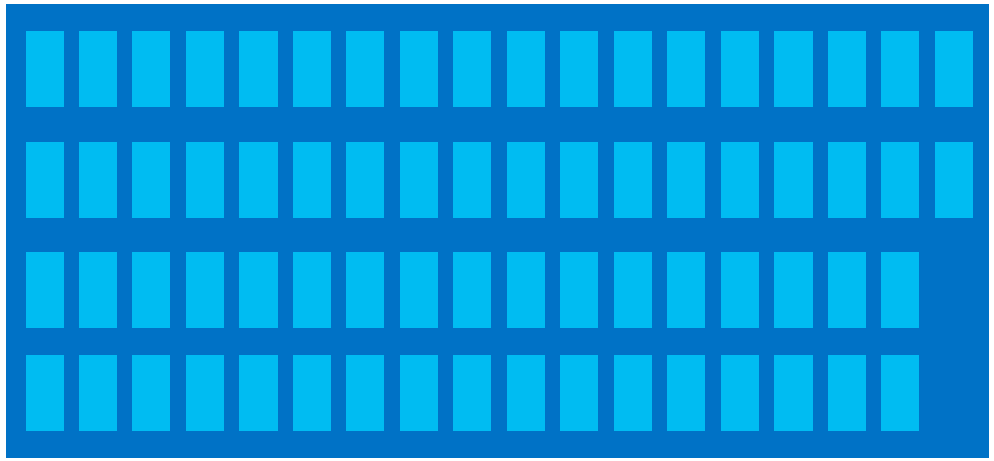


Data Host Failure

- HSA01 marked as failed
- PDW Cluster restarts compute node on a passive server
- ISCSI VM does not fail over

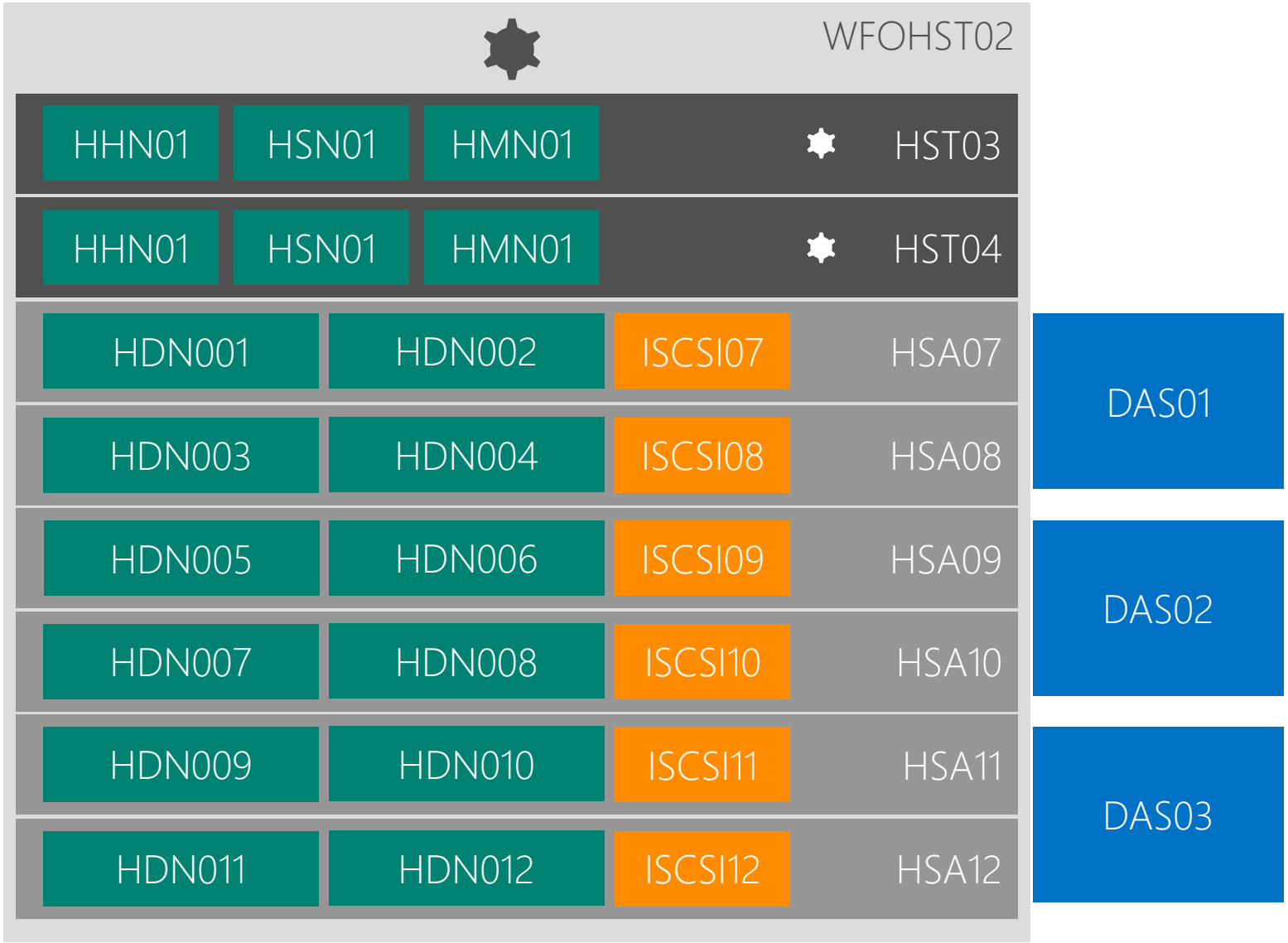
PDW Disk Failure

- Storage Spaces mirrors disks
  - Disks paired from different trays in the array for enhanced availability
  - 32 RAID 1 data volumes created – 16 per compute node
- 4 hot spares available in each DAS array
- VHDX files for VMs held on DAS array



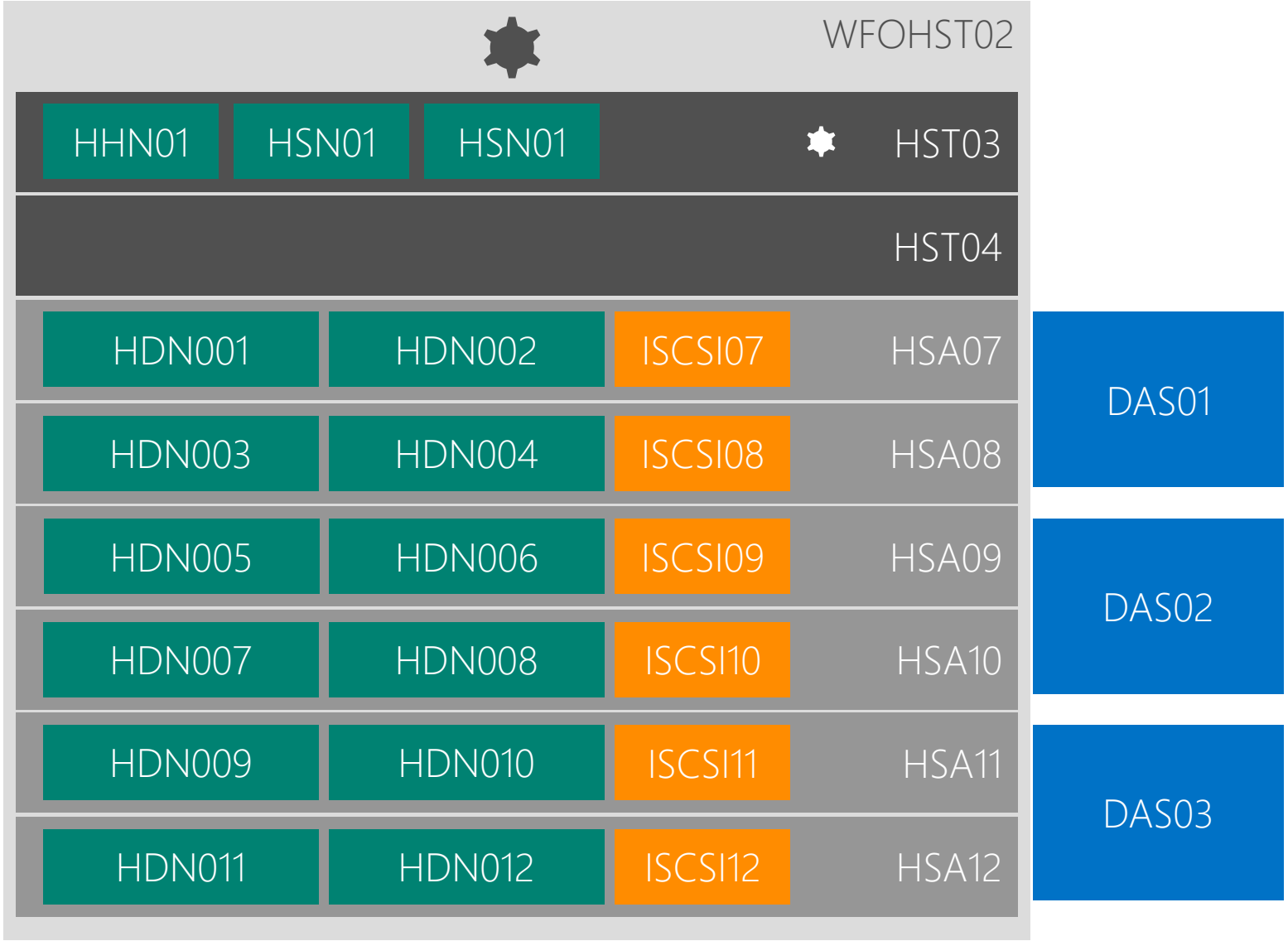
HDI Name Node Failure

- HHN01 node fails
- Corralling service detects failure & marked as failed
- Cluster fails Corralling service to HST04
- Corralling service stops and starts VMs in the following order
  - Management (HMN01)
  - Head (HHN01)
  - Secure Gateway (HSN01)



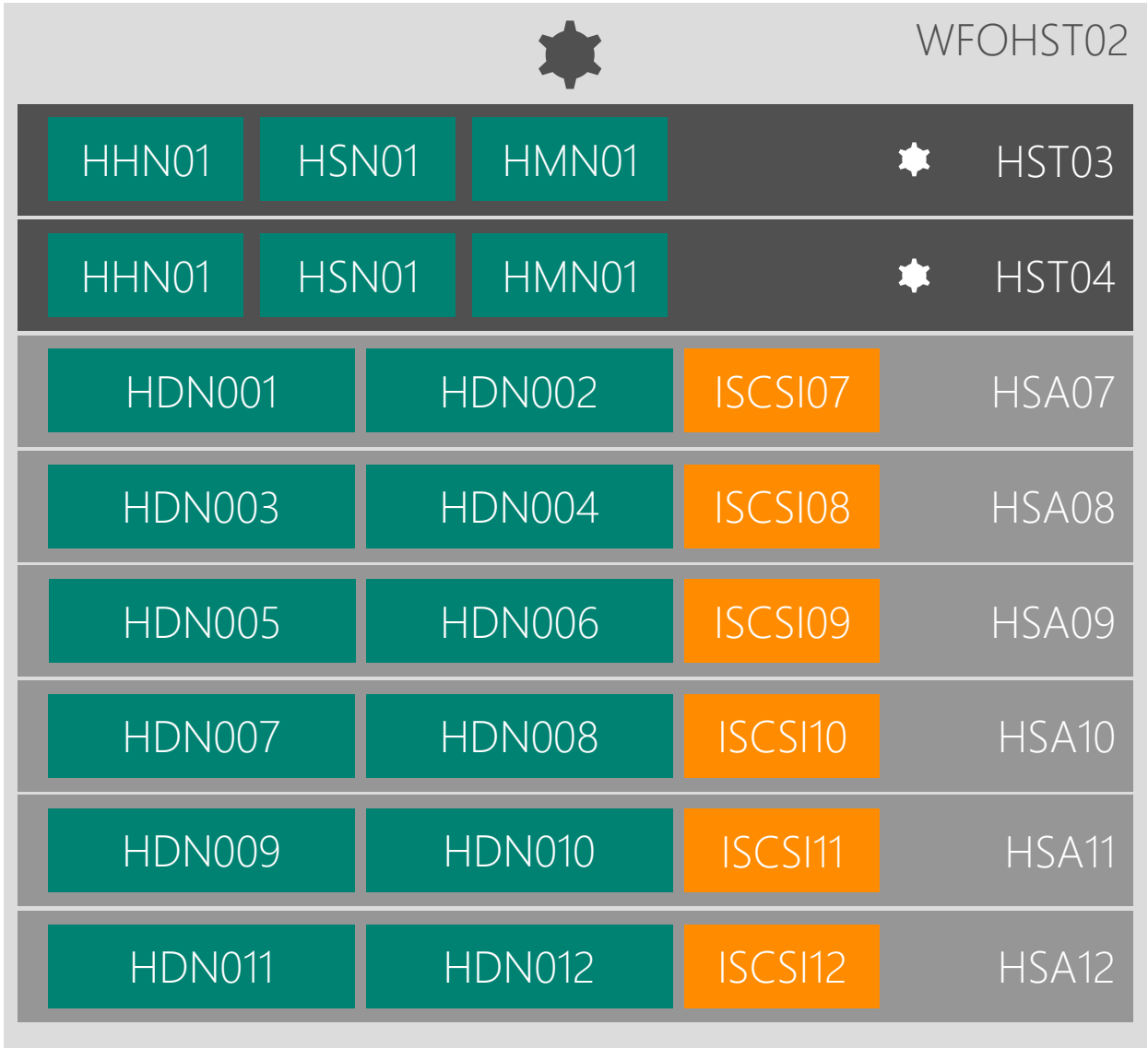
Data Node Failure

- Data node fails
- Data node does not fail over
- Hadoop data replication ensures data is available on other data nodes
- ISCSI VM does not fail over
- Replication is relied upon for availability



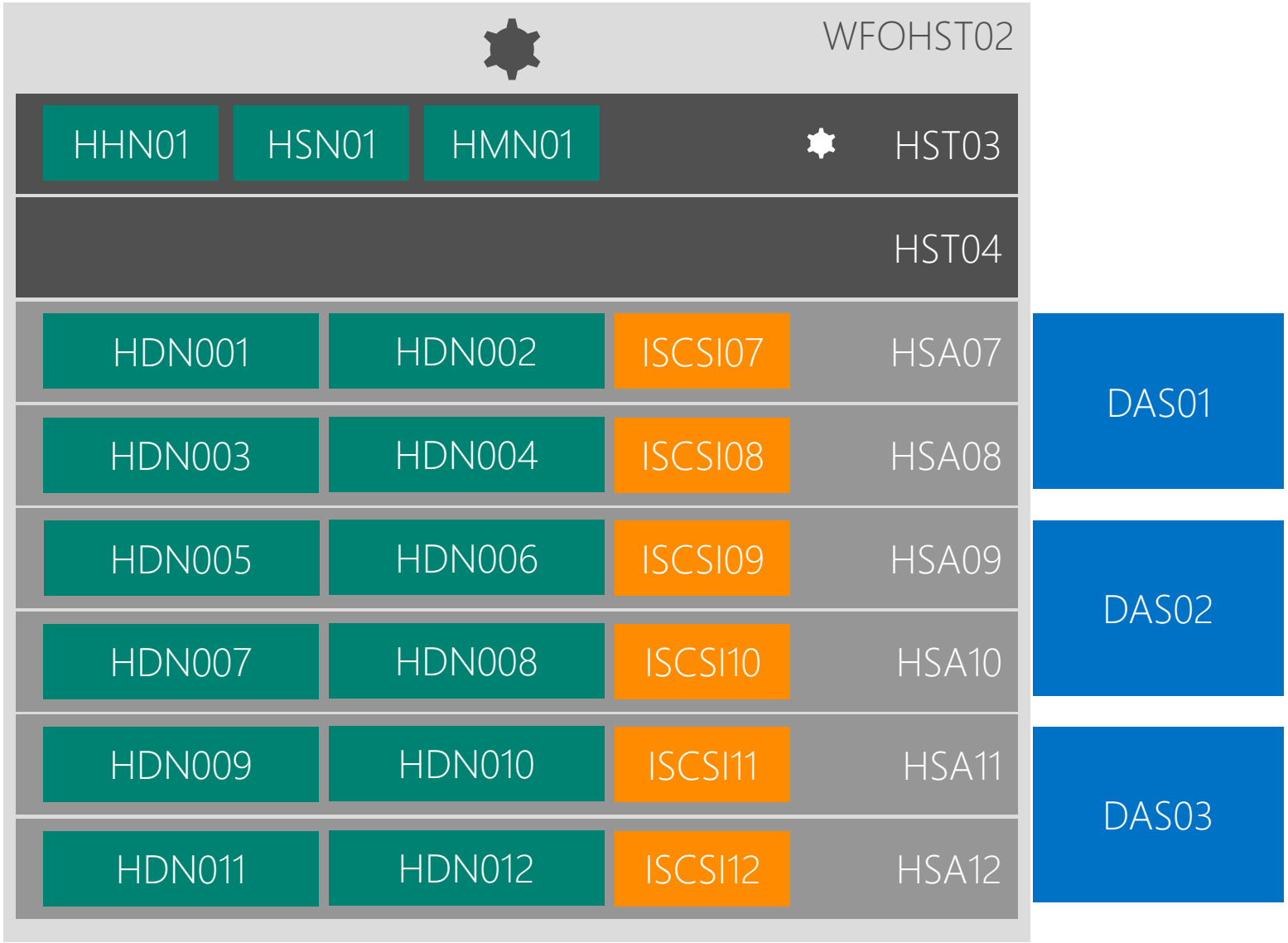
Orchestration Host Failure

- HST03 node fails
- Corralling Service marked as failed
- Cluster fails Corralling service to HST04
- Corralling service restarts VMs in the following order
  - Management (HMN01)
  - Head Node (HHN01)
  - Secure Gateway (HSN01)



Data Host Failure

- HSA07 fails
- HSA07 marked as failed
- Data Nodes do not fail over
- ISCSI VM does not fail over
- Replication is relied on for availability



Hadoop Region HA

- Failover of orchestration and passive hosts behaves the same as for PDW
- Data nodes are different
  - APS relies on Hadoop data replication for data availability
  - Disks are not mirrored
  - Data nodes do not failover
  - Replication factor is configurable

#Scale Units	Replication Factor	Polybase
=1	2	3
>1	3	3

Key Differences Between Regions

PDW

- Compute node VMs failover to Passive Server
- Compute node data disks are mirrored
- HA managed via failover clustering for all nodes

Hadoop

- Data Node VMs do not failover
- Data Node data disks not mirrored
- HA managed in application tier for Data Nodes
- HA managed via failover clustering for Head Node

Points to Note

- Network & power have redundancy built into appliance - no single points of failure in these layers
- Domain controllers are single points of failure within the appliance
- 1st rack can be configured with additional passive servers
- If all compute nodes attached to a DAS array fail then PDW Cluster is offline
- Additional passive server increases availability when failures happen on separate base / scale units
- Failback is performed by CSS

Configuration Management

Pre-Sales Configuration Decisions

- Regions
- Amount of compute scale
- Disk size
- Power requirement
- Vendor
- Increased availability
- Enhanced networking
- Backup server
- Loading server

PDW Region: HP

# Scale Units	# Compute Nodes	#CPU Cores	Mem (GB)	# Data Disks	Raw Capacity (TB)			Usable Capacity (TB)			Uplift
					1	2	3	1	2	3	
1	2	32	512	64	64	128	192	15.1	30.2	45.3	-
2	4	64	1024	128	128	256	384	30.2	60.4	90.6	100%
3	6	96	1536	192	192	384	576	45.3	90.6	135.9	50%
4	8	128	2048	256	256	512	768	60.4	120.8	181.2	33%
5	10	160	2560	320	320	640	960	75.5	151.0	226.5	25%
6	12	192	3072	384	384	768	1152	90.6	181.2	271.8	20%
8	16	256	4096	512	512	1024	1536	120.8	241.6	362.4	33%
10	20	320	5120	640	640	1280	1920	151.0	302.0	453.0	25%
12	24	384	6144	768	768	1536	2304	181.2	362.4	543.6	20%
16	32	512	8192	1024	1024	2048	3072	241.6	483.2	724.8	33%
20	40	640	10240	1280	1280	2560	3840	302.0	604.0	906.0	25%
24	48	768	12288	1536	1536	3072	4608	362.4	724.8	1087.2	20%
28	56	896	14336	1792	1792	3584	5376	422.8	845.6	1268.4	17%

PDW Region: DELL & Quanta

# Scale Units	# Compute Nodes	#CPU Cores	Mem (GB)	# Data Disks	Raw Capacity (TB)			Usable Capacity (TB)			Uplift
					1	2	3	1	2	3	
1	3	48	768	96	96	192	288	22.65	45.30	67.95	-
2	6	96	1536	192	192	384	576	45.30	90.60	135.90	100%
3	9	144	2304	288	288	576	864	67.95	135.90	203.85	50%
4	12	192	3072	384	384	768	1152	90.60	181.20	271.80	33%
5	15	240	3840	480	480	960	1440	113.25	226.50	339.75	25%
6	18	288	4608	576	576	1152	1728	135.90	271.80	407.70	20%
7	21	336	5376	672	672	1344	2016	158.55	317.10	475.65	17%
8	24	384	6144	768	768	1536	2304	181.20	362.40	543.60	14%
9	27	432	6912	864	864	1728	2592	203.85	407.70	611.55	13%
12	36	576	9216	1152	1152	2304	3456	271.80	543.60	815.40	33%
15	45	720	11520	1440	1440	2880	4320	339.75	679.50	1019.25	25%
18	54	864	13824	1728	1728	3456	5184	407.70	815.40	1223.10	20%

Factoring in Compression: HP

Compression Ratio	# Compute Nodes (1TB Drives)												
	2	4	6	8	10	12	16	20	24	32	40	48	56
1	15.1	30.2	45.3	60.4	75.5	90.6	121	151	181	242	302	362	423
2	30.2	60.4	90.6	121	151	181	242	302	362	483	604	725	846
3	45.3	90.6	136	181	227	272	362	453	544	725	906	1087	1268
4	60.4	121	181	242	302	362	483	604	725	966	1208	1450	1691
5	75.5	151	227	302	378	453	604	755	906	1208	1510	1812	2114
6	90.6	181	272	362	453	544	725	906	1087	1450	1812	2174	2537
7	106	211	317	423	529	634	846	1057	1268	1691	2114	2537	2960
8	121	242	362	483	604	725	966	1208	1450	1933	2416	2899	3382
9	136	272	408	544	680	815	1087	1359	1631	2174	2718	3262	3805
10	151	302	453	604	755	906	1208	1510	1812	2416	3020	3624	4228
11	166	332	498	664	831	997	1329	1661	1993	2658	3322	3986	4651
12	181	362	544	725	906	1087	1450	1812	2174	2899	3624	4349	5074
13	196	393	589	785	982	1178	1570	1963	2356	3141	3926	4711	5496
14	211	423	634	846	1057	1268	1691	2114	2537	3382	4228	5074	5919
15	227	453	680	906	1133	1359	1812	2265	2718	3624	4530	5436	6342

Compression: DELL & Quanta

Compression Ratio	# Compute Nodes (1TB Drives)											
	3	6	9	12	15	18	21	24	27	36	45	54
1	23	45	68	91	113	136	159	181	204	272	340	408
2	45	91	136	181	227	272	317	362	408	544	680	815
3	68	136	204	272	340	408	476	544	612	815	1019	1223
4	91	181	272	362	453	544	634	725	815	1087	1359	1631
5	113	227	340	453	566	680	793	906	1019	1359	1699	2039
6	136	272	408	544	680	815	951	1087	1223	1631	2039	2446
7	159	317	476	634	793	951	1110	1268	1427	1903	2378	2854
8	181	362	544	725	906	1087	1268	1450	1631	2174	2718	3262
9	204	408	612	815	1019	1223	1427	1631	1835	2446	3058	3669
10	227	453	680	906	1133	1359	1586	1812	2039	2718	3398	4077
11	249	498	747	997	1246	1495	1744	1993	2242	2990	3737	4485
12	272	544	815	1087	1359	1631	1903	2174	2446	3262	4077	4892
13	294	589	883	1178	1472	1767	2061	2356	2650	3533	4417	5300
14	317	634	951	1268	1586	1903	2220	2537	2854	3805	4757	5708
15	340	680	1019	1359	1699	2039	2378	2718	3058	4077	5096	6116

Decide # Compute Nodes to Buy

Buy based on scan performance

Scan performance is affected by

- Number of Compute nodes
- Compression ratio

Compression vs. Scan Performance

# Seconds to Scan a 1 TB table at 200 MB/second							
# Compute Nodes		2	3	4	6	8	9
# Distributions		16	24	32	48	64	72
Compression Ratio	1	327.68	218.45	163.84	109.23	81.92	72.82
	2	163.84	109.23	81.92	54.61	40.96	36.41
	3	109.23	72.82	54.61	36.41	27.31	24.27
	4	81.92	54.61	40.96	27.31	20.48	18.20
	5	65.54	43.69	32.77	21.85	16.38	14.56
	6	54.61	36.41	27.31	18.20	13.65	12.14
	7	46.81	31.21	23.41	15.60	11.70	10.40
	8	40.96	27.31	20.48	13.65	10.24	9.10
	9	36.41	24.27	18.20	12.14	9.10	8.09
	10	32.77	21.85	16.38	10.92	8.19	7.28
	11	29.79	19.86	14.89	9.93	7.45	6.62
	12	27.31	18.20	13.65	9.10	6.83	6.07
	13	25.21	16.80	12.60	8.40	6.30	5.60
	14	23.41	15.60	11.70	7.80	5.85	5.20
	15	21.85	14.56	10.92	7.28	5.46	4.85

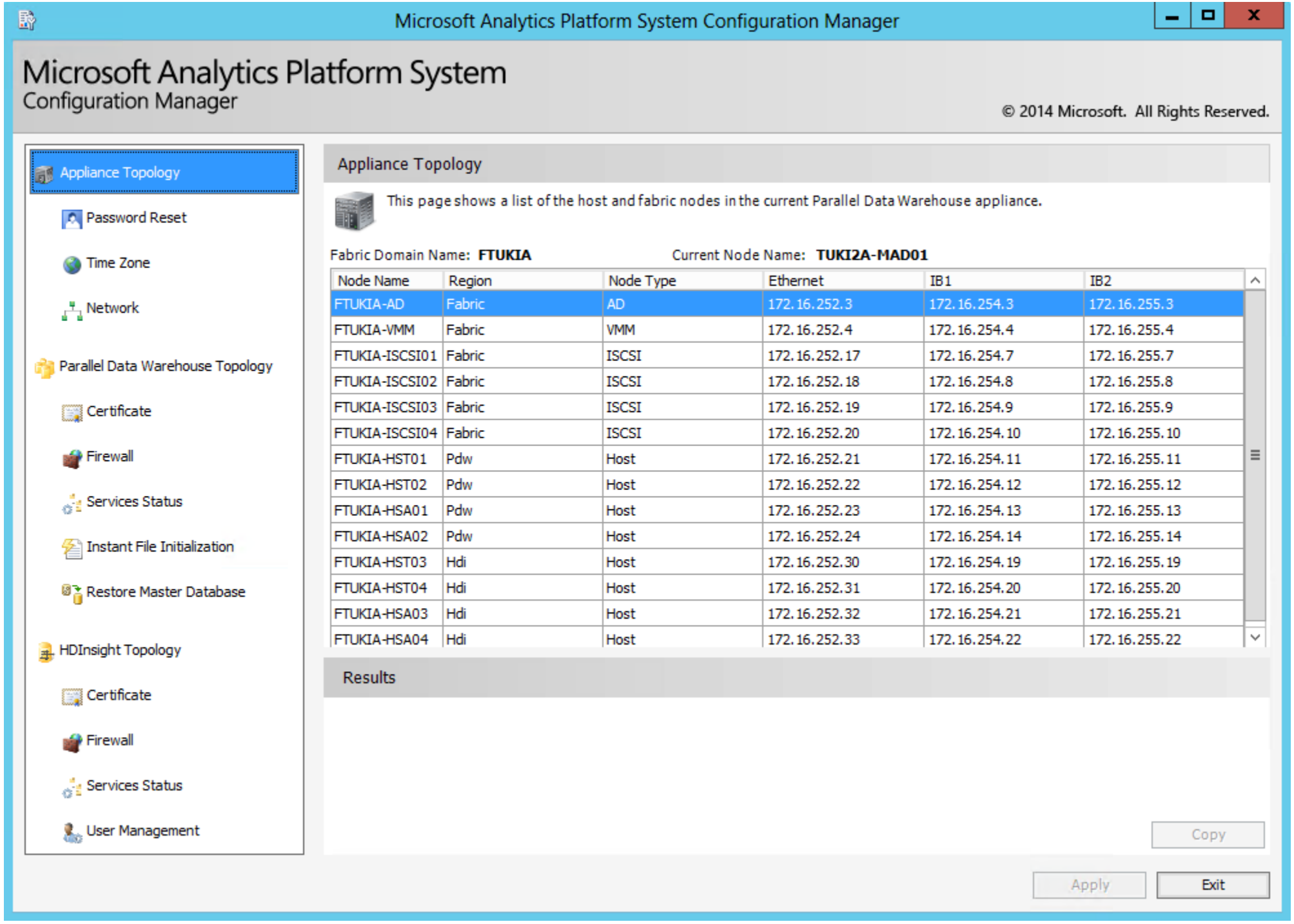
Hadoop Region: HP

# Scale Units	# Compute Nodes	#CPU Cores	#Data Nodes	# Data Disks	Raw Capacity (TB)			Repl Factor	Usable Capacity (TB)		
					1	2	3		1	2	3
1	2	32	4	48	48	96	144	2	24	48	72
2	4	64	8	96	96	192	288	3	32	64	96
3	6	96	12	144	144	288	432	3	48	96	144
5	10	160	20	240	240	480	720	3	80	160	240
7	14	224	28	336	336	672	1008	3	112	224	336
11	22	352	44	528	528	1056	1584	3	176	352	528
15	30	480	60	720	720	1440	2160	3	240	480	720
19	38	608	76	912	912	1824	2736	3	304	608	912
23	46	736	92	1104	1104	2208	3312	3	368	736	1104
27	54	864	108	1296	1296	2592	3888	3	432	864	1296

Hadoop Region: DELL & Quanta

# Scale Units	# Compute Nodes	#CPU Cores	#Data Nodes	# Data Disks	Raw Capacity (TB)			Repl Factor	Usable Capacity (TB)		
					1	2	3		1	2	3
1	3	48	6	72	72	144	216	2	36	72	108
2	6	96	12	144	144	288	432	3	48	96	144
3	9	144	18	216	216	432	648	3	72	144	216
4	12	192	24	288	288	576	864	3	96	192	288
5	15	240	30	360	360	720	1080	3	120	240	360
8	24	384	48	576	576	1152	1728	3	192	384	576
11	33	528	66	792	792	1584	2376	3	264	528	792
14	42	672	84	1008	1008	2016	3024	3	336	672	1008
17	51	816	102	1224	1224	2448	3672	3	408	816	1224

Appliance Configuration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Appliance Topology
Password Reset
Time Zone
Network
Parallel Data Warehouse Topology
Certificate
Firewall
Services Status
Instant File Initialization
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HDInsight Topology
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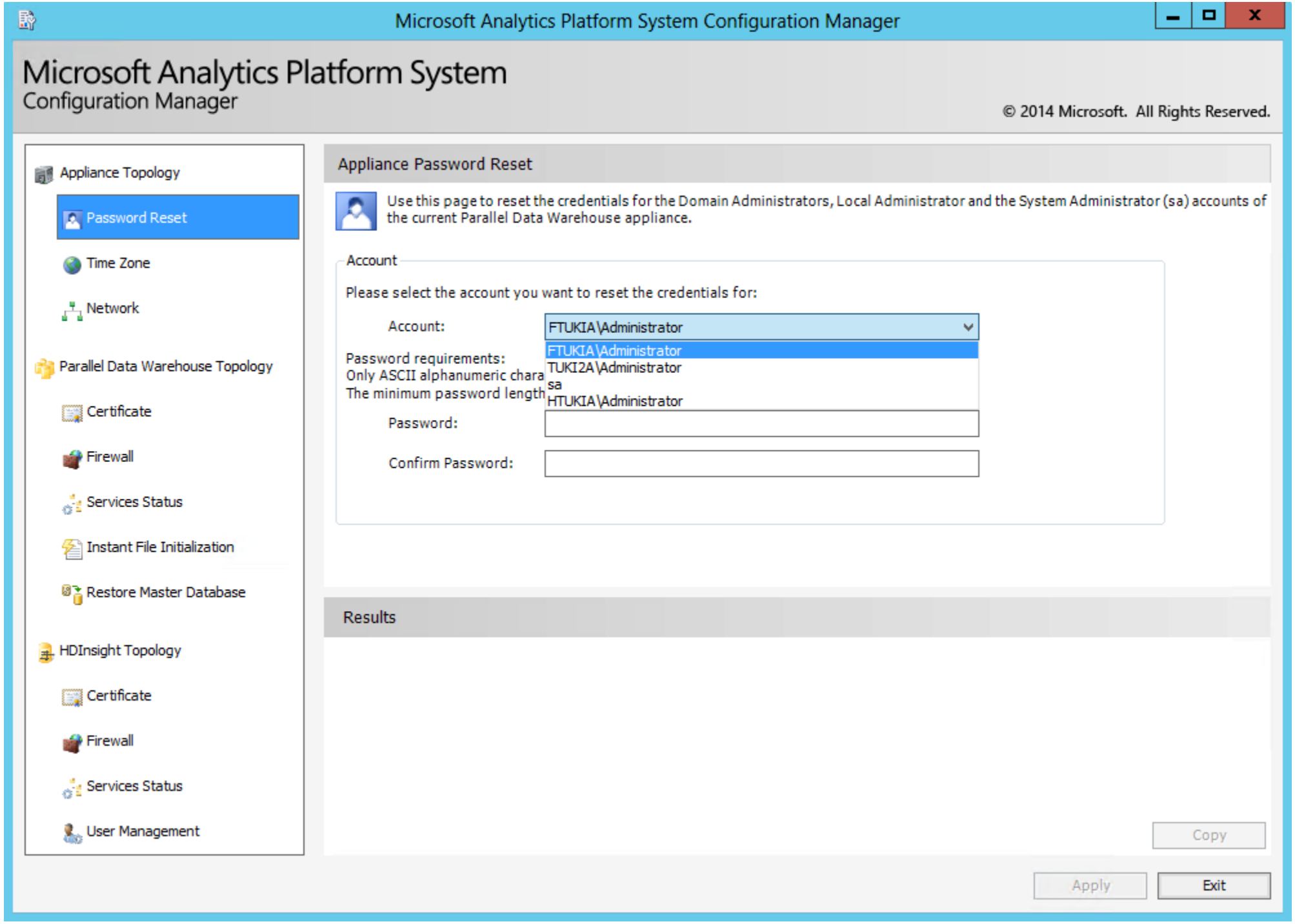
Appliance Topology
This page shows a list of the host and fabric nodes in the current Parallel Data Warehouse appliance.
Fabric Domain Name: FTUKIA
Current Node Name: TUKI2A-MAD01
Node Name | Region | Node Type | Ethernet | IB1 | IB2
FTUKIA-AD | Fabric | AD | 172.16.252.3 | 172.16.254.3 | 172.16.255.3
FTUKIA-VMM | Fabric | VMM | 172.16.252.4 | 172.16.254.4 | 172.16.255.4
FTUKIA-ISCSI01 | Fabric | ISCSI | 172.16.252.17 | 172.16.254.7 | 172.16.255.7
FTUKIA-ISCSI02 | Fabric | ISCSI | 172.16.252.18 | 172.16.254.8 | 172.16.255.8
FTUKIA-ISCSI03 | Fabric | ISCSI | 172.16.252.19 | 172.16.254.9 | 172.16.255.9
FTUKIA-ISCSI04 | Fabric | ISCSI | 172.16.252.20 | 172.16.254.10 | 172.16.255.10
FTUKIA-HST01 | Pdw | Host | 172.16.252.21 | 172.16.254.11 | 172.16.255.11
FTUKIA-HST02 | Pdw | Host | 172.16.252.22 | 172.16.254.12 | 172.16.255.12
FTUKIA-HSA01 | Pdw | Host | 172.16.252.23 | 172.16.254.13 | 172.16.255.13
FTUKIA-HSA02 | Pdw | Host | 172.16.252.24 | 172.16.254.14 | 172.16.255.14
FTUKIA-HST03 | Hdi | Host | 172.16.252.30 | 172.16.254.19 | 172.16.255.19
FTUKIA-HST04 | Hdi | Host | 172.16.252.31 | 172.16.254.20 | 172.16.255.20
FTUKIA-HSA03 | Hdi | Host | 172.16.252.32 | 172.16.254.21 | 172.16.255.21
FTUKIA-HSA04 | Hdi | Host | 172.16.252.33 | 172.16.254.22 | 172.16.255.22
Results
Copy
Apply
Exit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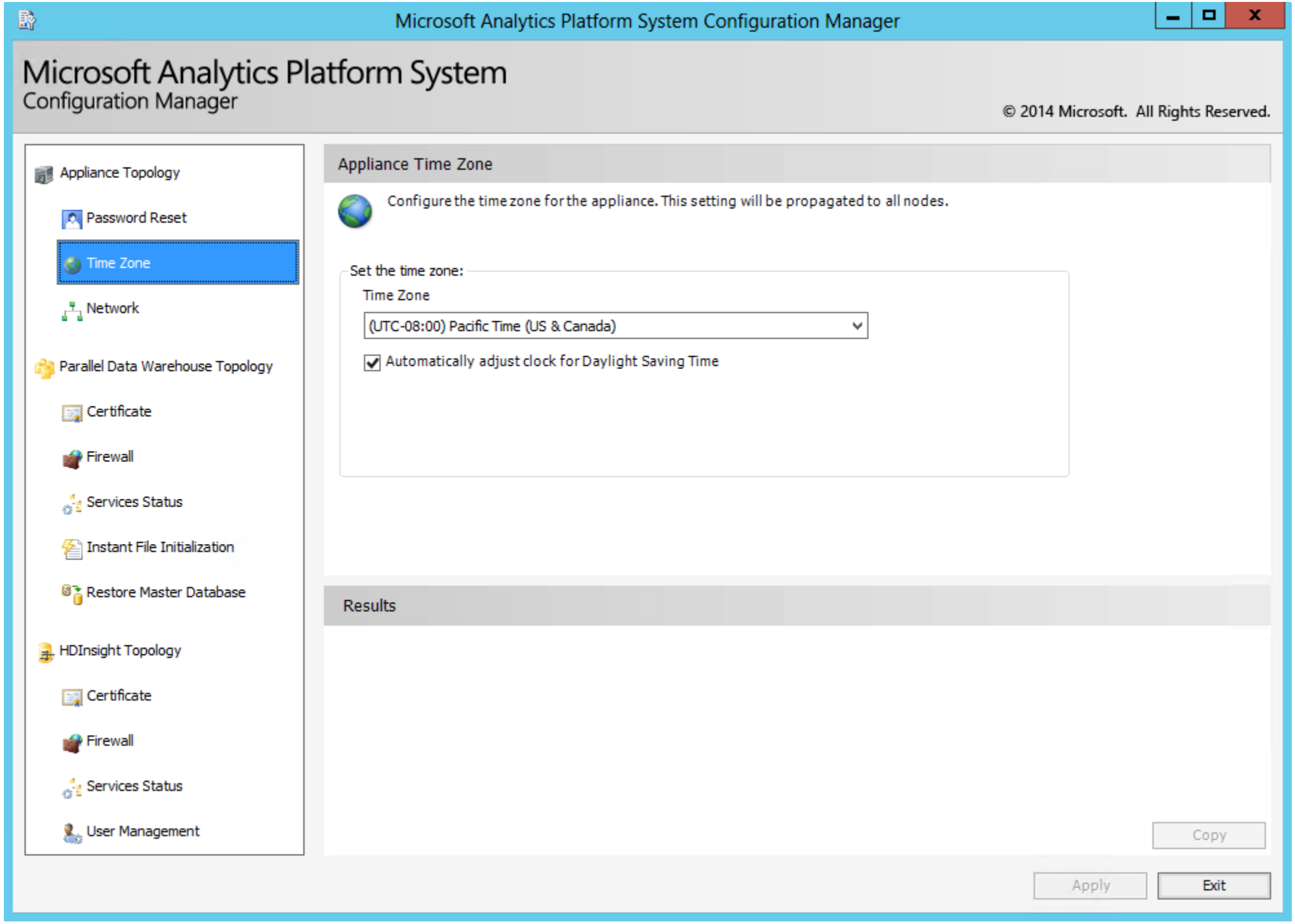
Appliance Password Reset
Use this page to reset the credentials for the Domain Administrators, Local Administrator and the System Administrator (sa) accounts of the current Parallel Data Warehouse appliance.
Account
Please select the account you want to reset the credentials for:
Account:
FTUKIA\Administrator
FTUKIA\Administrator
TUKI2A\Administrator
sa
HTUKIA\Administrator
Password requirements:
Only ASCII alphanumeric chara
The minimum password length
Password:
Confirm Password:
Results
Copy
Apply
Exit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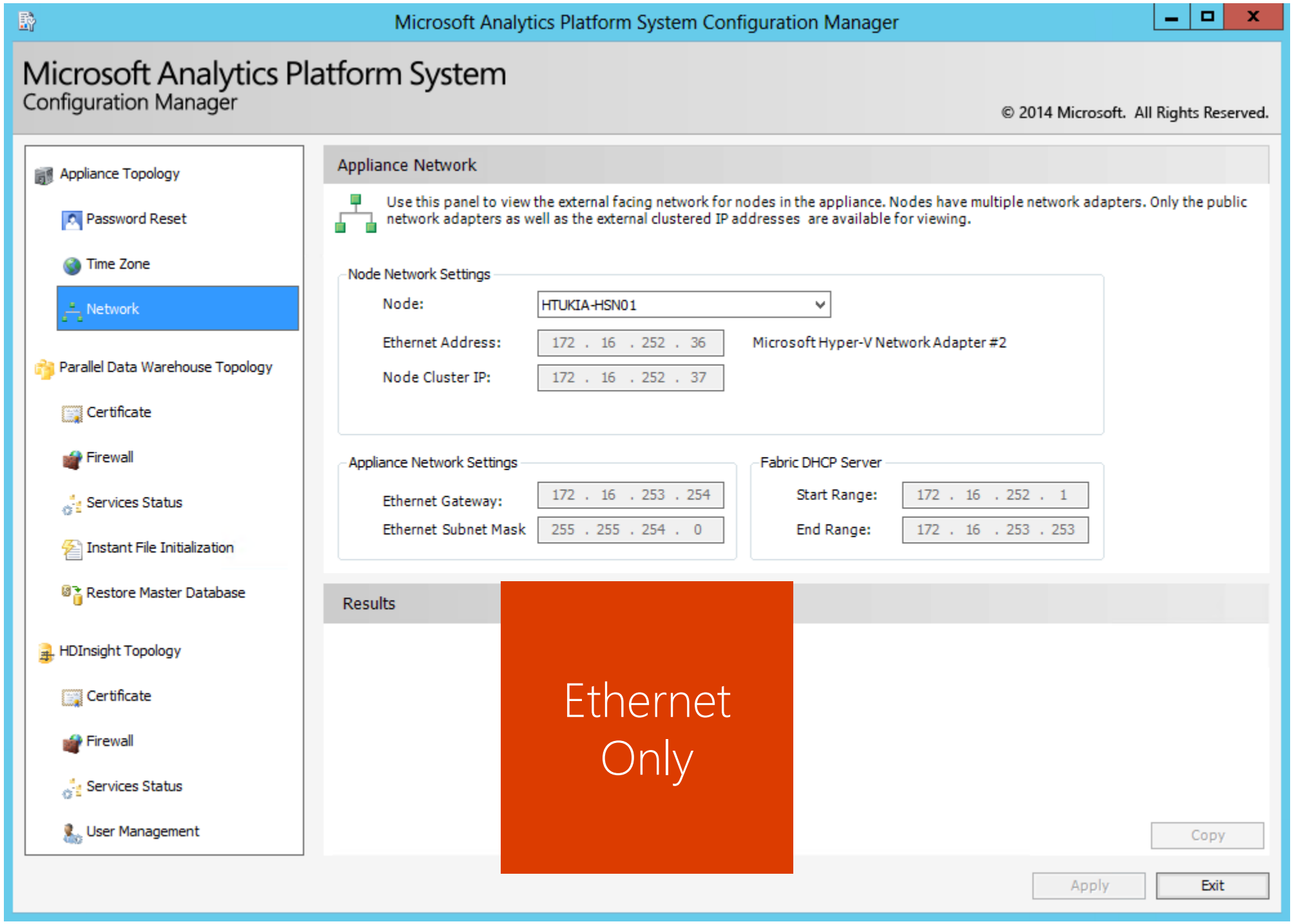
Appliance Time Zone
Configure the time zone for the appliance. This setting will be propagated to all nodes.
Set the time zone:
Time Zone
(UTC-08:00) Pacific Time (US & Canada)
Automatically adjust clock for Daylight Saving Time
Results
Copy
Apply
Exit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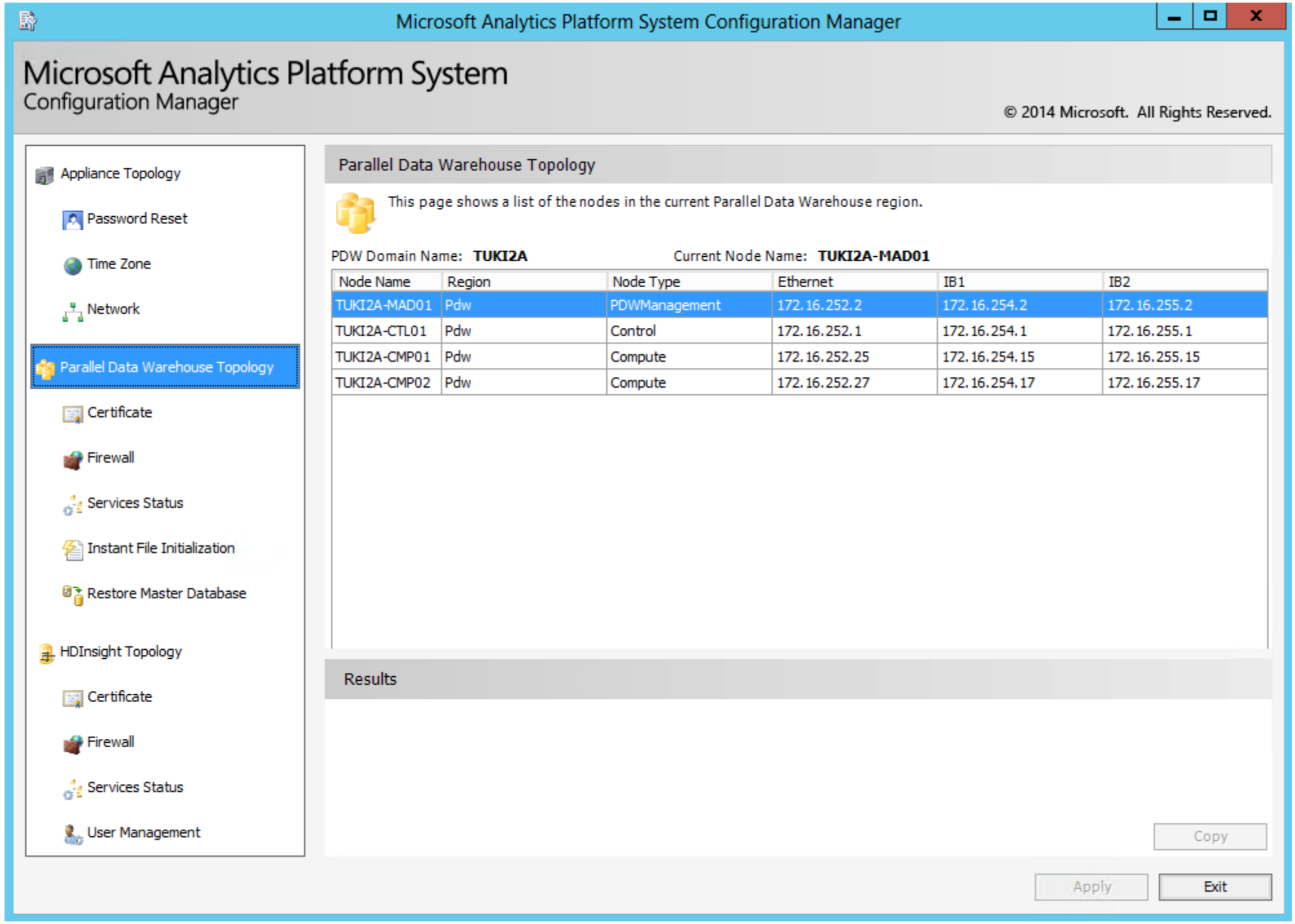
Appliance Network
Use this panel to view the external facing network for nodes in the appliance. Nodes have multiple network adapters. Only the public network adapters as well as the external clustered IP addresses are available for viewing.
Node Network Settings
Node:
HTUKIA-HSN01
Ethernet Address:
172 . 16 . 252 . 36
Microsoft Hyper-V Network Adapter #2
Node Cluster IP:
172 . 16 . 252 . 37
Appliance Network Settings
Ethernet Gateway:
172 . 16 . 253 . 254
Ethernet Subnet Mask
255 . 255 . 254 . 0
Fabric DHCP Server
Start Range:
172 . 16 . 252 . 1
End Range:
172 . 16 . 253 . 253
Results
Ethernet Only
Copy
Apply
Exit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Parallel Data Warehouse Topology
This page shows a list of the nodes in the current Parallel Data Warehouse region.
PDW Domain Name: TUKI2A
Current Node Name: TUKI2A-MAD01
Node Name | Region | Node Type | Ethernet | IB1 | IB2
TUKI2A-MAD01 | Pdw | PDWManagement | 172.16.252.2 | 172.16.254.2 | 172.16.255.2
TUKI2A-CTL01 | Pdw | Control | 172.16.252.1 | 172.16.254.1 | 172.16.255.1
TUKI2A-CMP01 | Pdw | Compute | 172.16.252.25 | 172.16.254.15 | 172.16.255.15
TUKI2A-CMP02 | Pdw | Compute | 172.16.252.27 | 172.16.254.17 | 172.16.255.17
Results
Copy
Apply
Exit

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Parallal Data Warehouse Certificate

Use this page to provision certificates for establishing secure connections to the Parallel Data Warehouse region on the appliance.

Certificate Provisioning

- ( ) Import a certificate and configure the PDW region on the appliance to use it
  - [ ] [Browse...]
  - Password: [ ]
- ( ) Remove any certificates provisioned in the appliance

Results

[Copy]

[Apply] [Exit]

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Parallel Data Warehouse Firewall

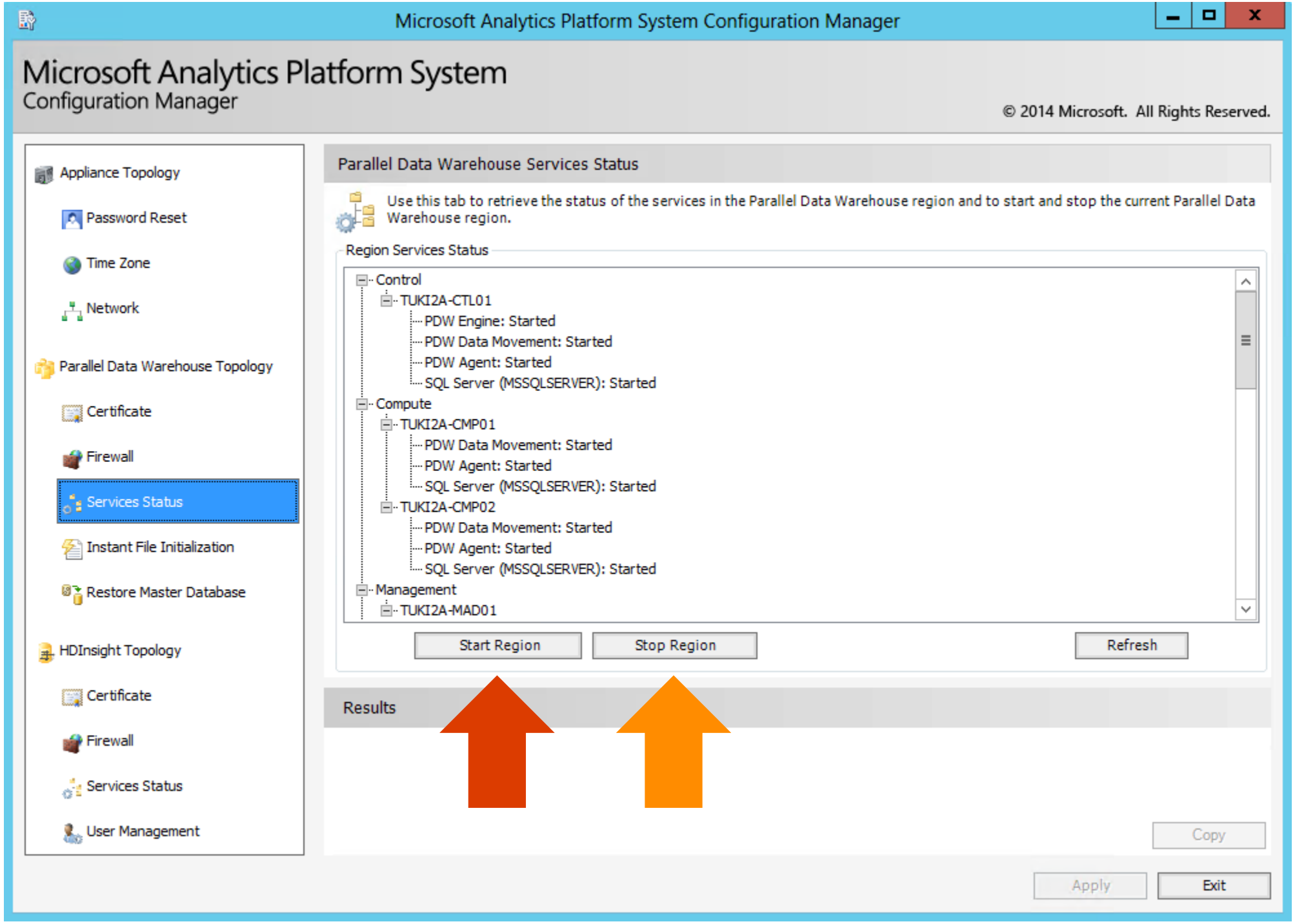
Use this page to enable or disable firewall rules that allow or prevent access to specific ports on the Parallel Data Warehouse region on the appliance.

	Node	Name	Group	Local Port	Remote Por
☑		Remote Desktop for External Management Access			
	TUKI2A-MAD01	SQL Server PDW Remote Desktop Access (Management)		3389	Any
☑		SQL Server PDW TDS Client Access for Control Nodes			
	TUKI2A-CTL01	SQL Server PDW TDS		17001	Any
☑		SQL Server PDW Admin Console			
	TUKI2A-CTL01	SQL Server PDW Admin Console		443	Any
☑		SSIS Loader and DWLoader for PDW (Control)			
	TUKI2A-CTL01	SQL Server PDW Load Control Flow - SQL Credentials		8001	Any
	TUKI2A-CTL01	SQL Server PDW Load Control Flow - Windows Credentials		8002	Any
	TUKI2A-CTL01	SQL Server PDW Load Data Flow		16551	Any
☑		SQL Server PDW Polybase Connectivity			
	TUKI2A-CTL01	SQL Server PDW Polybase Connectivity		Any	Any
	TUKI2A-CMP01	SQL Server PDW Polybase Connectivity		Any	Any
	TUKI2A-CMP02	SQL Server PDW Polybase Connectivity		Any	Any

Results

Copy

Apply Exit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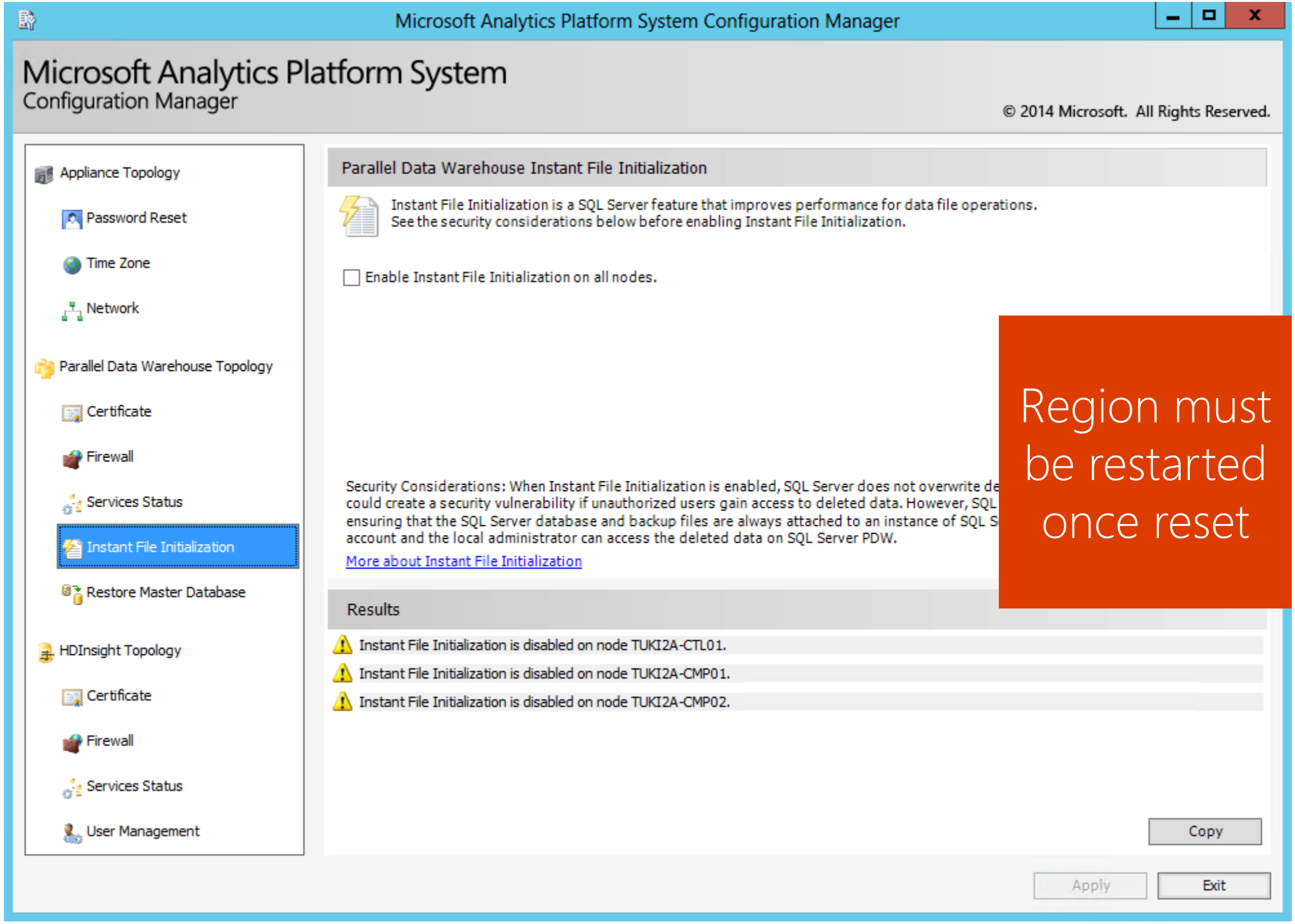
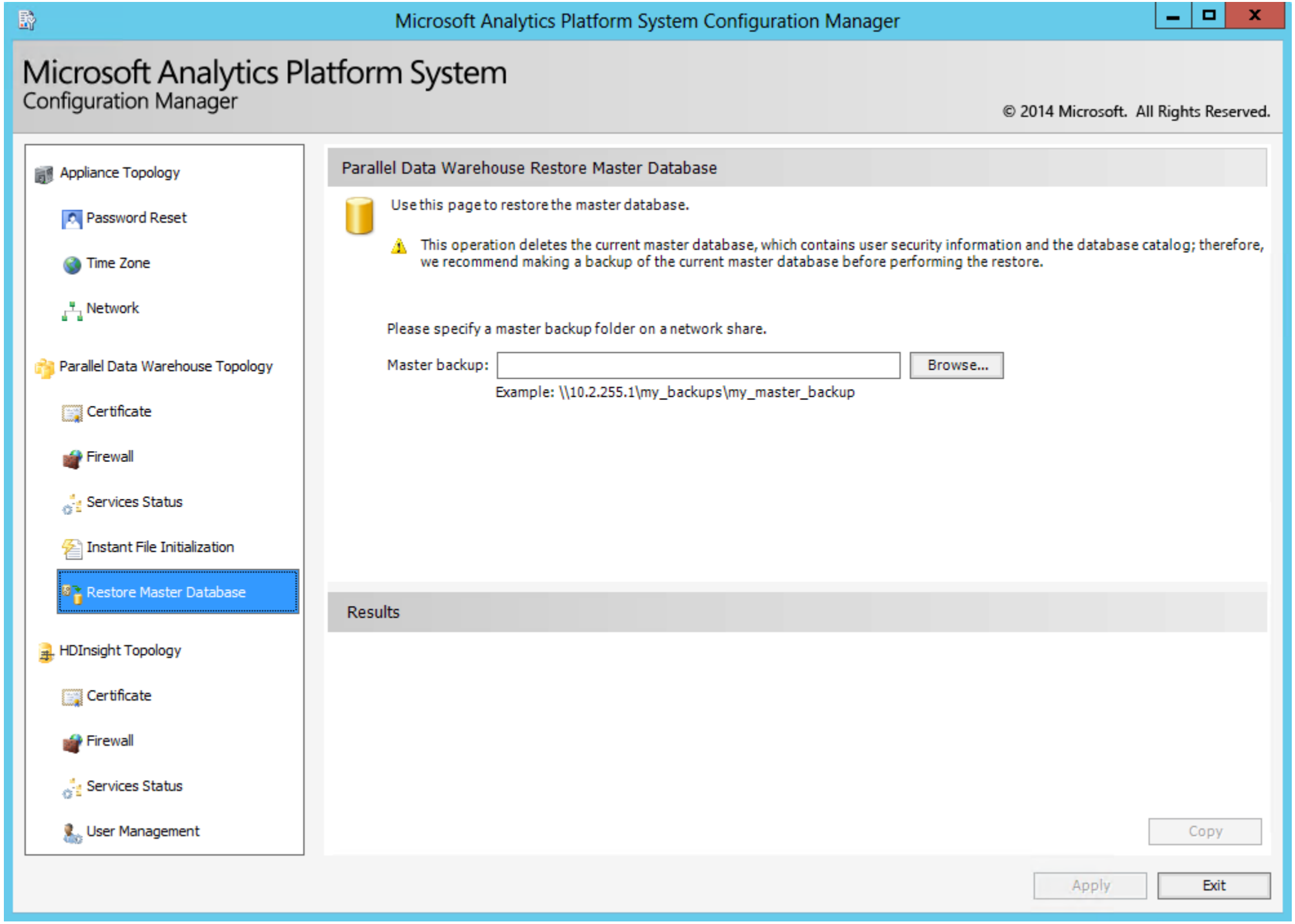
Parallel Data Warehouse Services Status
Use this tab to retrieve the status of the services in the Parallel Data Warehouse region and to start and stop the current Parallel Data Warehouse region.
Region Services Status
Control
TUKI2A-CTL01
PDW Engine: Started
PDW Data Movement: Started
PDW Agent: Started
SQL Server (MSSQLSERVER): Started
Compute
TUKI2A-CMP01
PDW Data Movement: Started
PDW Agent: Started
SQL Server (MSSQLSERVER): Started
TUKI2A-CMP02
PDW Data Movement: Started
PDW Agent: Started
SQL Server (MSSQLSERVER): Started
Management
TUKI2A-MAD01
Start Region
Stop Region
Refresh
Results
Copy
Apply
Exit



Region must be restarted once reset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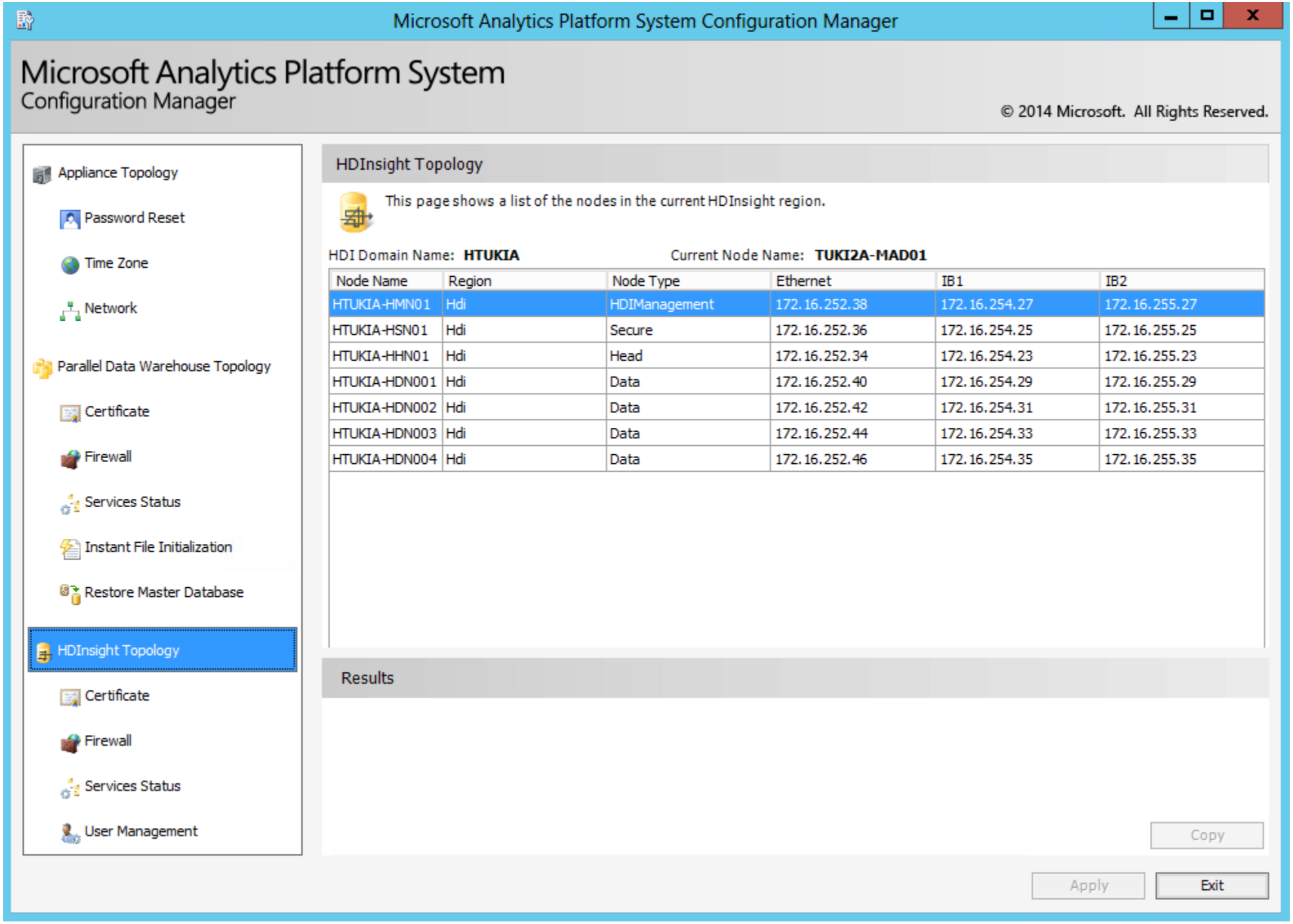
Parallel Data Warehouse Restore Master Database
Use this page to restore the master database.
This operation deletes the current master database, which contains user security information and the database catalog; therefore, we recommend making a backup of the current master database before performing the restore.
Please specify a master backup folder on a network share.
Master backup:
Browse...
Example: \\10.2.255.1\my_backups\my_master_backup
Results
Copy
Apply
Exit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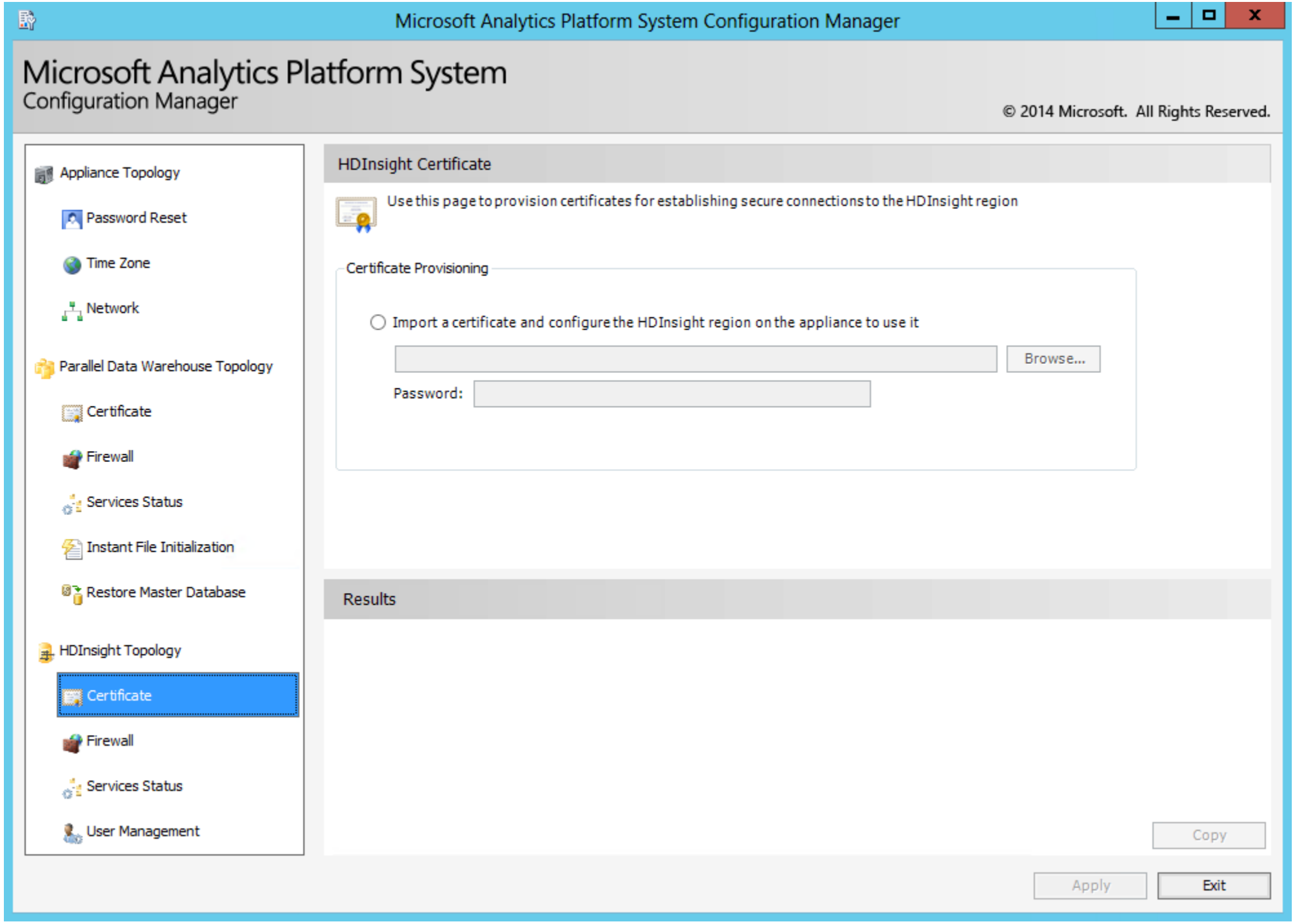
HDInsight Topology
Certificate
Firewall
Services Status
User Management
HDInsight Topology
This page shows a list of the nodes in the current HDInsight region.
HDI Domain Name: HTUKIA
Current Node Name: TUKI2A-MAD01
Node Name | Region | Node Type | Ethernet | IB1 | IB2
HTUKIA-HMN01 | Hdi | HDIManagement | 172.16.252.38 | 172.16.254.27 | 172.16.255.27
HTUKIA-HSN01 | Hdi | Secure | 172.16.252.36 | 172.16.254.25 | 172.16.255.25
HTUKIA-HHN01 | Hdi | Head | 172.16.252.34 | 172.16.254.23 | 172.16.255.23
HTUKIA-HDN001 | Hdi | Data | 172.16.252.40 | 172.16.254.29 | 172.16.255.29
HTUKIA-HDN002 | Hdi | Data | 172.16.252.42 | 172.16.254.31 | 172.16.255.31
HTUKIA-HDN003 | Hdi | Data | 172.16.252.44 | 172.16.254.33 | 172.16.255.33
HTUKIA-HDN004 | Hdi | Data | 172.16.252.46 | 172.16.254.35 | 172.16.255.35
Results
Copy
Apply
Exit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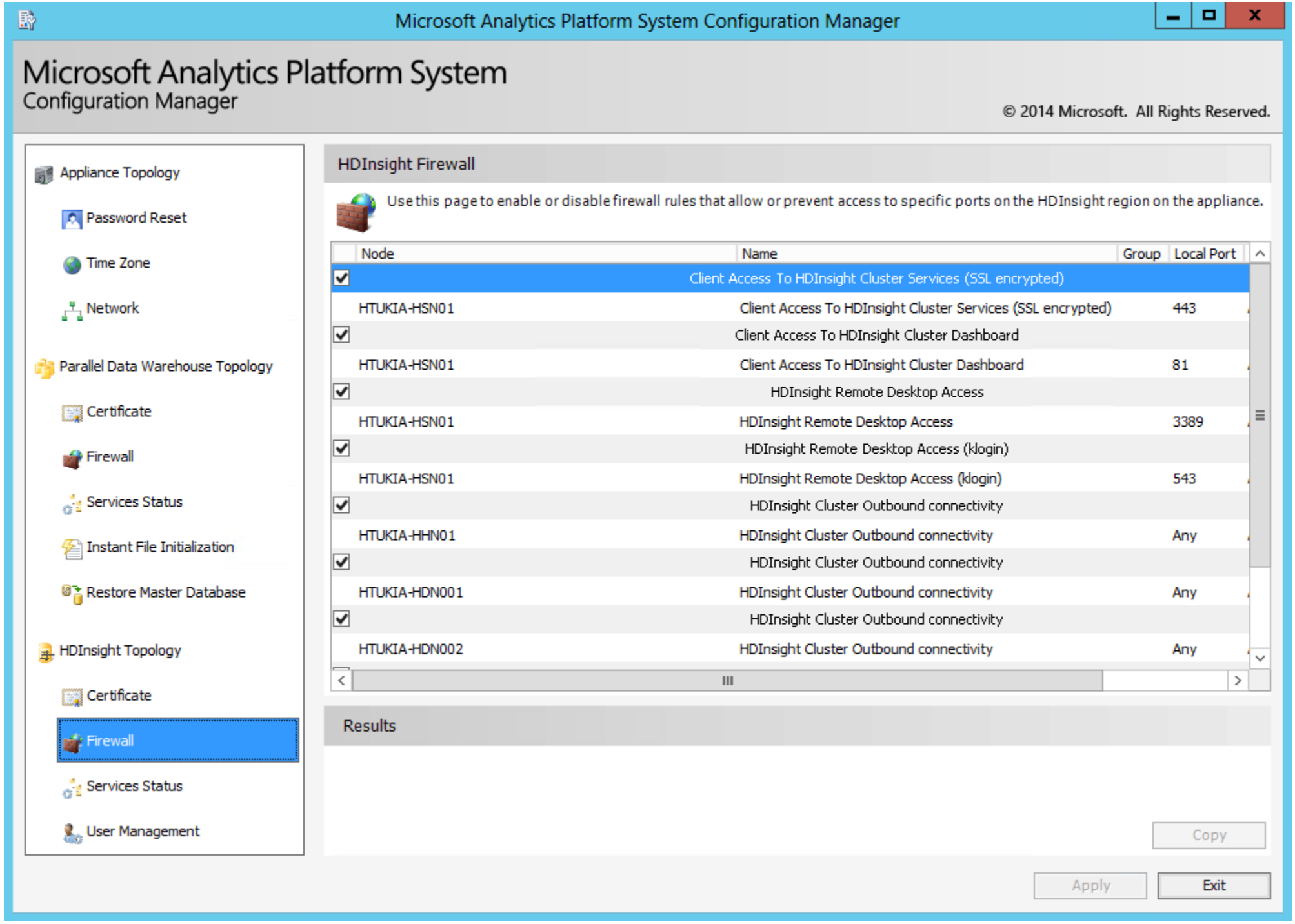
User Management
HDInsight Certificate
Use this page to provision certificates for establishing secure connections to the HDInsight region
Certificate Provisioning
Import a certificate and configure the HDInsight region on the appliance to use it
Browse...
Password:
Results
Copy
Apply
Exit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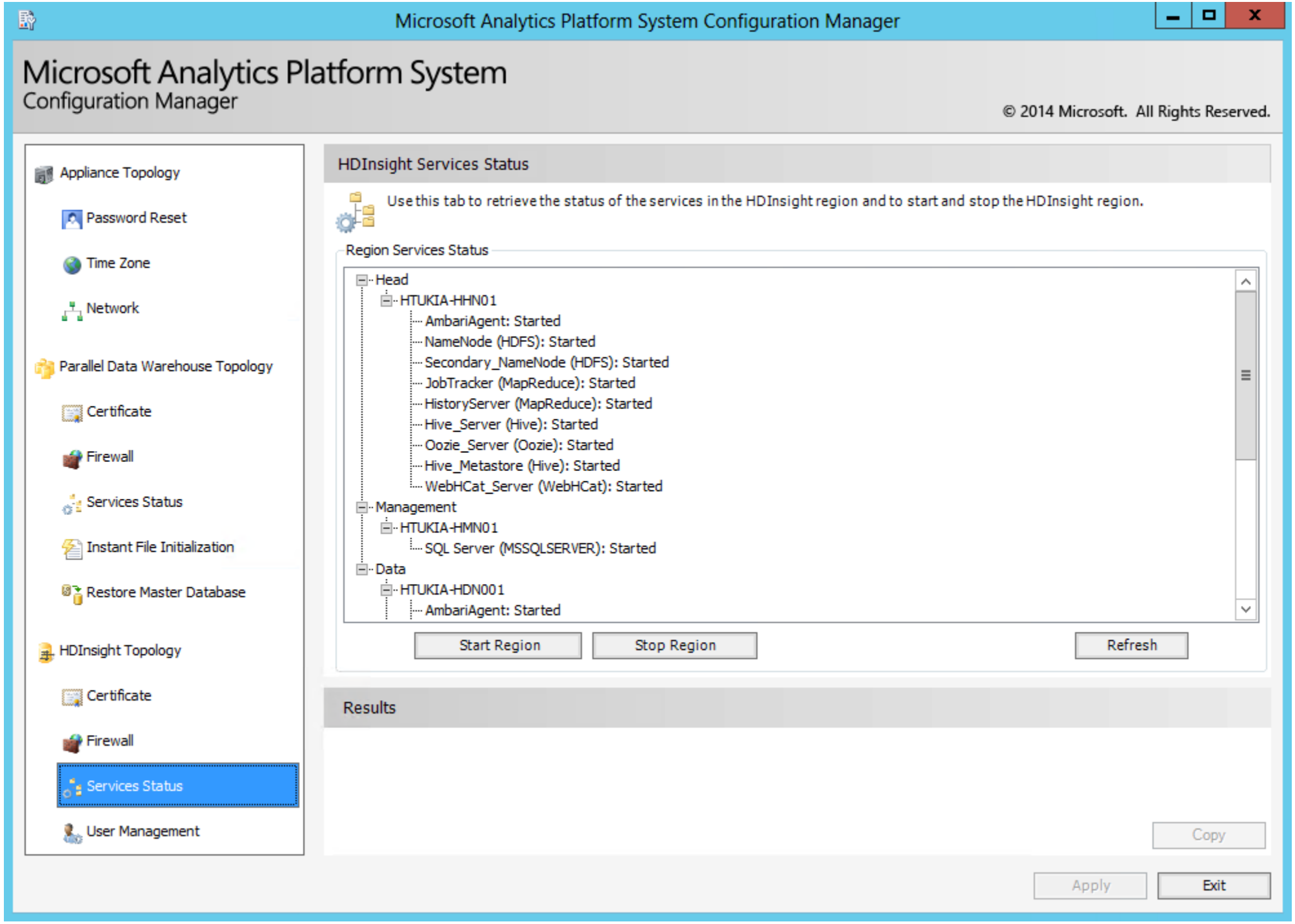
HDInsight Firewall
Use this page to enable or disable firewall rules that allow or prevent access to specific ports on the HDInsight region on the appliance.
Node
Name
Group
Local Port
Client Access To HDInsight Cluster Services (SSL encrypted)
HTUKIA-HSN01
Client Access To HDInsight Cluster Services (SSL encrypted)
443
Client Access To HDInsight Cluster Dashboard
HTUKIA-HSN01
Client Access To HDInsight Cluster Dashboard
81
HDInsight Remote Desktop Access
HTUKIA-HSN01
HDInsight Remote Desktop Access
3389
HDInsight Remote Desktop Access (klogin)
HTUKIA-HSN01
HDInsight Remote Desktop Access (klogin)
543
HDInsight Cluster Outbound connectivity
HTUKIA-HHN01
HDInsight Cluster Outbound connectivity
Any
HDInsight Cluster Outbound connectivity
HTUKIA-HDN001
HDInsight Cluster Outbound connectivity
Any
HDInsight Cluster Outbound connectivity
HTUKIA-HDN002
HDInsight Cluster Outbound connectivity
Any
Results
Copy
Apply
Exit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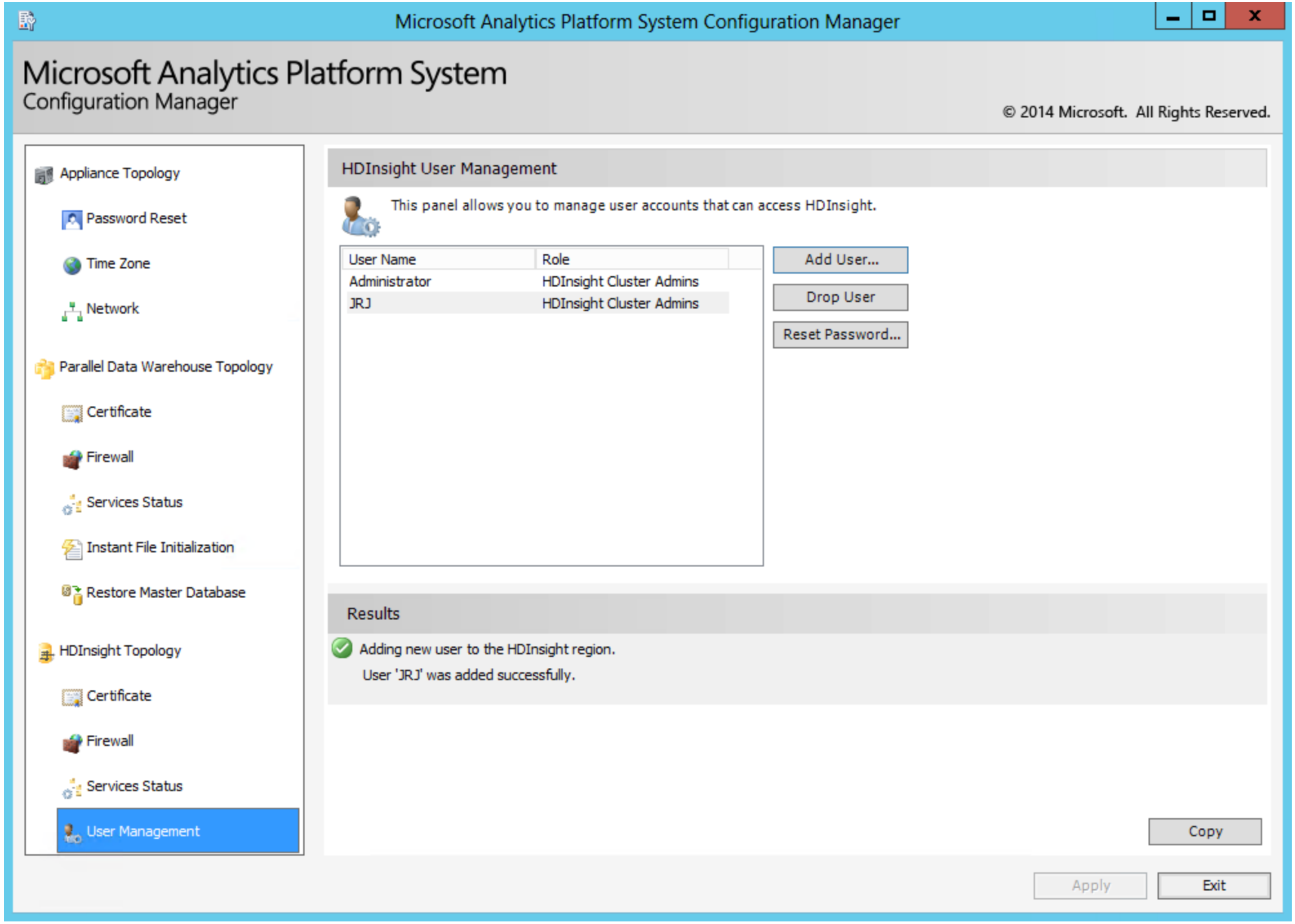
HDInsight Services Status
Use this tab to retrieve the status of the services in the HDInsight region and to start and stop the HDInsight region.
Region Services Status
Head
HTUKIA-HHN01
AmbariAgent: Started
NameNode (HDFS): Started
Secondary_NameNode (HDFS): Started
JobTracker (MapReduce): Started
HistoryServer (MapReduce): Started
Hive_Server (Hive): Started
Oozie_Server (Oozie): Started
Hive_Metastore (Hive): Started
WebHCat_Server (WebHCat): Started
Management
HTUKIA-HMN01
SQL Server (MSSQLSERVER): Started
Data
HTUKIA-HDN001
AmbariAgent: Started
Start Region
Stop Region
Refresh
Results
Copy
Apply
Exit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User Management
HDInsight User Management
This panel allows you to manage user accounts that can access HDInsight.
User Name
Role
Administrator
HDInsight Cluster Admins
JRJ
HDInsight Cluster Admins
Add User...
Drop User
Reset Password...
Results
Adding new user to the HDInsight region.
User 'JRJ' was added successfully.
Copy
Apply
Exit

Networking Requirements

Networking Basics

Information collected during Site Survey

Primary network requirements

- IP address ranges
  - 4 ranges required
  - Whole Subnets reserved

IP Addresses

Each Virtual Node	# of IP Addresses
Ethernet IP	1
Infiniband	2

Each ISCSI Node	# of IP Addresses
Ethernet IP	1
Infiniband	2

Each Compute Node (additional)	# of IP Addresses
Cluster IP (1 node)	1
Cluster Infiniband	2

Each Physical Host	# of IP Addresses
Ethernet IP	1
Infiniband	2
Infrastructure IP	1

Each PDU	# of IP Addresses
Power	2

Each Switch	# of IP Addresses
Ethernet Switch	2
Infiniband Switch	2

Each Cluster	# of IP Addresses
Ethernet IP	2

IP Address Example: Base PDW Region

Logical	# IP Addresses
Control node	3
Management node	3
Fabric active directory	3
Virtual Machine Manager	3
Compute nodes (2)	12
ISCSI nodes (2)	6
PDW region cluster IP	1

Physical	# IP Addresses
Physical hosts (4)	16
Power PDU (2)	2
Ethernet switches (2)	2
Infiniband switches (2)	2

Totals	# IP Addresses
Logical	31
Physical	22
Total	53

External Dependencies

Components PDW depends on

- Backup server
- Loading server(s)
- Hadoop cluster (maybe)
- Azure Storage Blobs (WASB)
- System Center / monitoring
- Analytics / business intelligence/ reporting

Updating the Appliance

Agenda

- Appliance Updates
- Hotfixes
- Patching

Appliance Updates

Covers

- Firmware
- Drivers
- All software
- Features

Operations & Schedule

- Two updates a year
- Offline operation
- Affects all regions
- Also updated
  - Client tools
  - SSIS destination adapters
  - Help file

AU1 Feature Set

- New Hadoop Region
  - In-appliance Hadoop option
- Polybase
  - Updated Hadoop distribution support
  - Pushdown predicate
  - Statistics on external tables
  - De-coupled DDL
- Load
  - dwloader.exe
    - Performance
    - Date management
- Management
  - Trusted Authentication
  - Transparent Data Encryption
- Development
  - SSDT update

Hotfixes

- Do not use WSUS
- Run an exe from HST01
- Appliance offline
- Affects all hosts and regions

- Can update client tools
  - SSIS destination adapters
  - Client tools
    - Dwloader
    - Dwsql (deprecated)
- Needs all domain admin passwords
  - Fabric domain
  - PDW Region domain
  - Hadoop Region domain

Patching

- Uses WSUS
- WSUS installed on VMM node
- WSUS server must support
  - Anonymous connections
  - SSL
- Covers all physical hosts & virtual machines
- Have handy
  - Domain Administrator Account
  - Login w/ VIEW SERVER STATE permission
  - IP Address - WSUS server
  - IP Address - Proxy server

Basic Settings

- Language
  - English
- Products updated
  - SQL Server 2012
  - System Center 2012 VMM
  - System Center 2012 SP1 VMM
- Patch class
  - Security
  - Critical
- Sync schedule
  - Manual only

Client Tools Updates

SSIS adapters & client tools

- Updated via Hotfix or AU
- MSI's deployed onto the Control node
  - C:\PDWINST\ClientTools

Not propagated or installed automatically

- Uninstall first
- Install second

SSDT?

- Download from the Internet
- Required to expose AU1 features

Important Notes

Areas to be Aware of

Corporate group policies

- Avoid extending these to appliance domains
- May interfere with smooth operation of appliance

Anti-virus software on appliance

- Supported but not recommended
- Details of configuration in PDW Help file – "Antivirus Software"

Additional domain administrators

- Hadoop Region
- Supported but not recommended