Cloud Day

Nov 17, 2016

Clouds

- IaaS – Infrastructure as a Service
- PaaS – Platform as a Service
- SaaS – Software as a Service

- *aaS – *Anything* as a Service


amazon.com
rackspace
redhat.
piston
nebula
SOFTLAYER
CITRIX
CloudPassage
actifio
Joyent
Parallels
terremark
nicira
ORACLE
EUCALYPTUS
nimbula
vmware
Infrastructure
as-a-Service
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Platform
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Infrastructure
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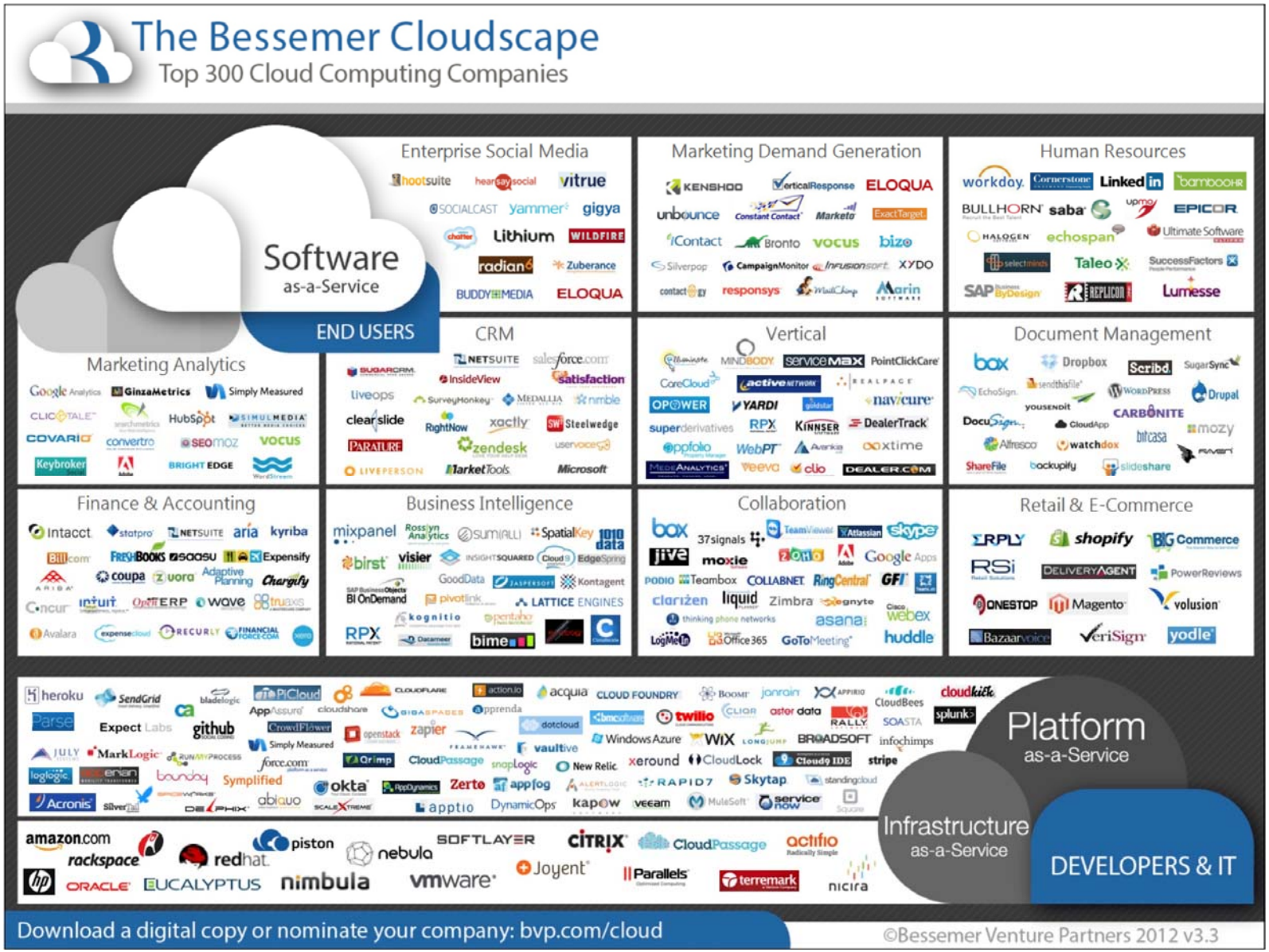
The Bessemer Cloudscape
Top 300 Cloud Computing Companies
Software
as-a-Service
END USERS
Enterprise Social Media
Marketing Demand Generation
Human Resources
Marketing Analytics
CRM
Vertical
Document Management
Finance & Accounting
Business Intelligence
Collaboration
Retail & E-Commerce
Platform
as-a-Service
Infrastructure
as-a-Service
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Multi-tenancy

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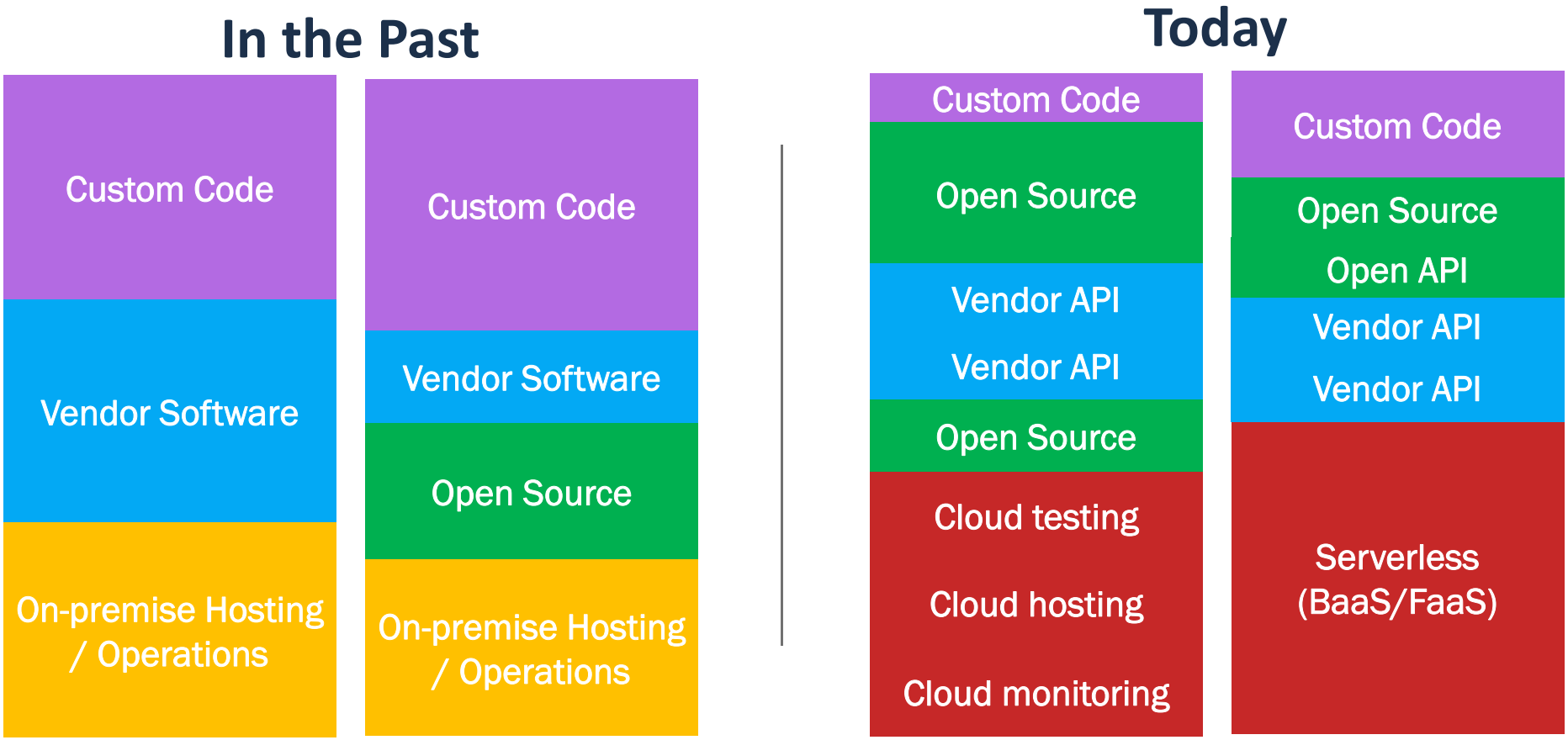
Developers

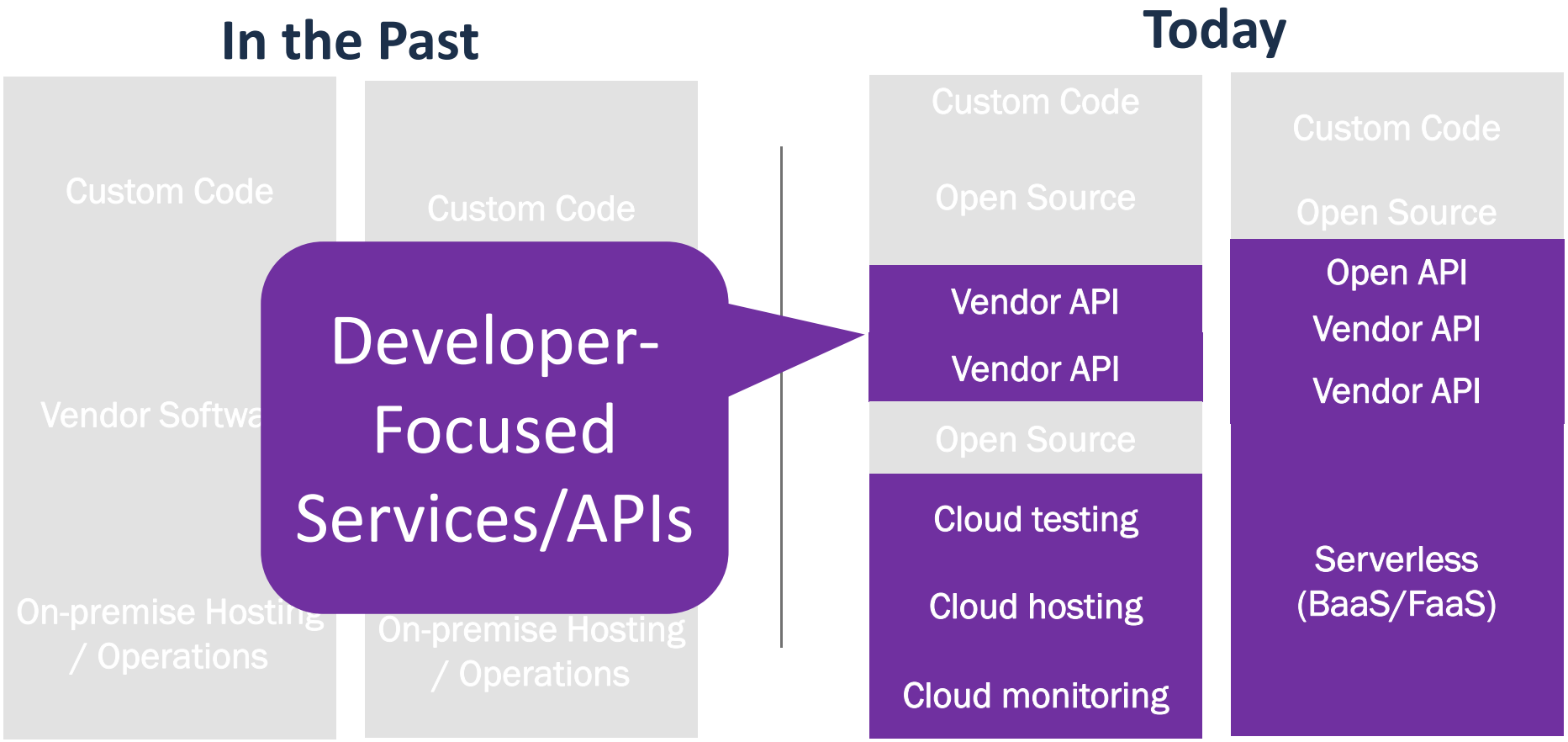
Build vs. buy in the Federal Government

Some small portion of the systems must be built or heavily customized because off-the-shelf solutions that meet requirements do not exists.

Evolution of web & mobile development



Rapid migration to composition of services



What has changed…

- Compose vs. develop
- Microservices vs. monolithic applications
- APIs and online services vs. static libraries
- Small vertically integrated teams vs. large functional teams
- Units tests and continuous integration vs. separate testing orgs
- Continuous deployment vs. major releases
- Developer/product manager buyer vs. GM/CIO buyer

Buying Cloud

- Can be complex…

Pricing details

Estimate your expected monthly bill using our Pricing Calculator, and **track your actual account usage and bill** at any time using the billing portal. Setup automatic email billing alerts to be notified if your spend goes above an amount you configure.

Pricing calculator

Detailed pricing information

Compute

- Linux Virtual Machines
- Windows Virtual Machines
- Virtual Machine Scale Sets
- App Service
- Azure Container Service
- Functions
- Batch
- Service Fabric
- Cloud Services

Networking

- Virtual Network
- Load Balancer
- Application Gateway
- VPN Gateway
- Azure DNS
- CDN
- Traffic Manager
- ExpressRoute
- Bandwidth

Storage

- Storage
- Data Lake Store
- StorSimple
- Backup
- Site Recovery

Web + Mobile

- App Service
- Logic Apps
- CDN
- Media Services
- Search
- Mobile Engagement
- API Management
- Notification Hubs

New Relic Application Performance Monitoring pricing for your environments.

Our cloud pricing lets you track your account's usage in a variable manner based on the size of your instance, as calculated by Compute Unit. Pay less per hour for smaller sized instances and only get billed for the hours those instances are actively running.

Monthly pricing is scaled for hosts running 24/7, approximately 750 hours per month. Our annual plans start as low as $38 per month. View our pricing table for common host providers.

Estimate your price.

DYNAMIC SELECT Cloud environment pricing	**DEDICATED** SELECT On prem environment pricing	**HYBRID / MIXED** SELECT Hybrid environment pricing

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Pricing

Universal Directory	Single Sign-On	Lifecycle Management	MFA	Mobility Management
$1/mo	$2/mo	$4*/mo	Starting at $3/mo	$4/mo
per user	per user	per user	per user	per user

Enterprise customer with 5,000+ users?

Request a quote

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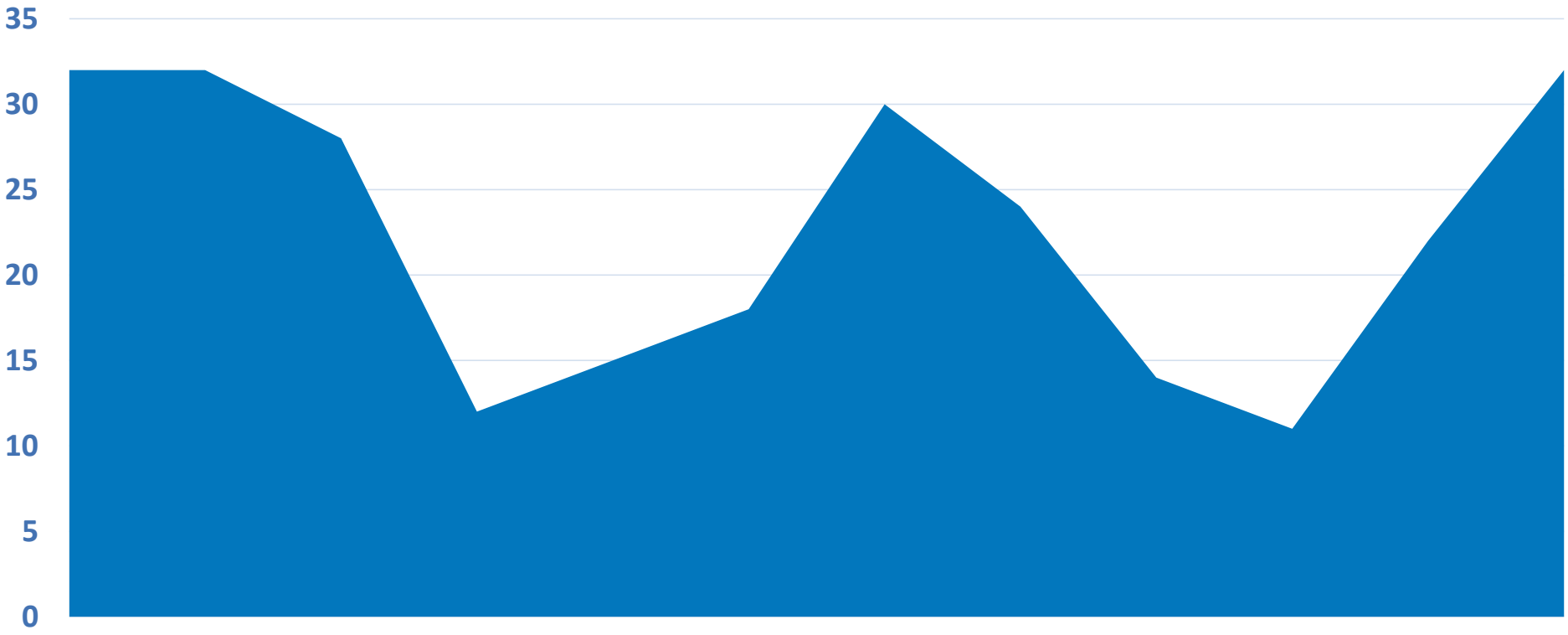
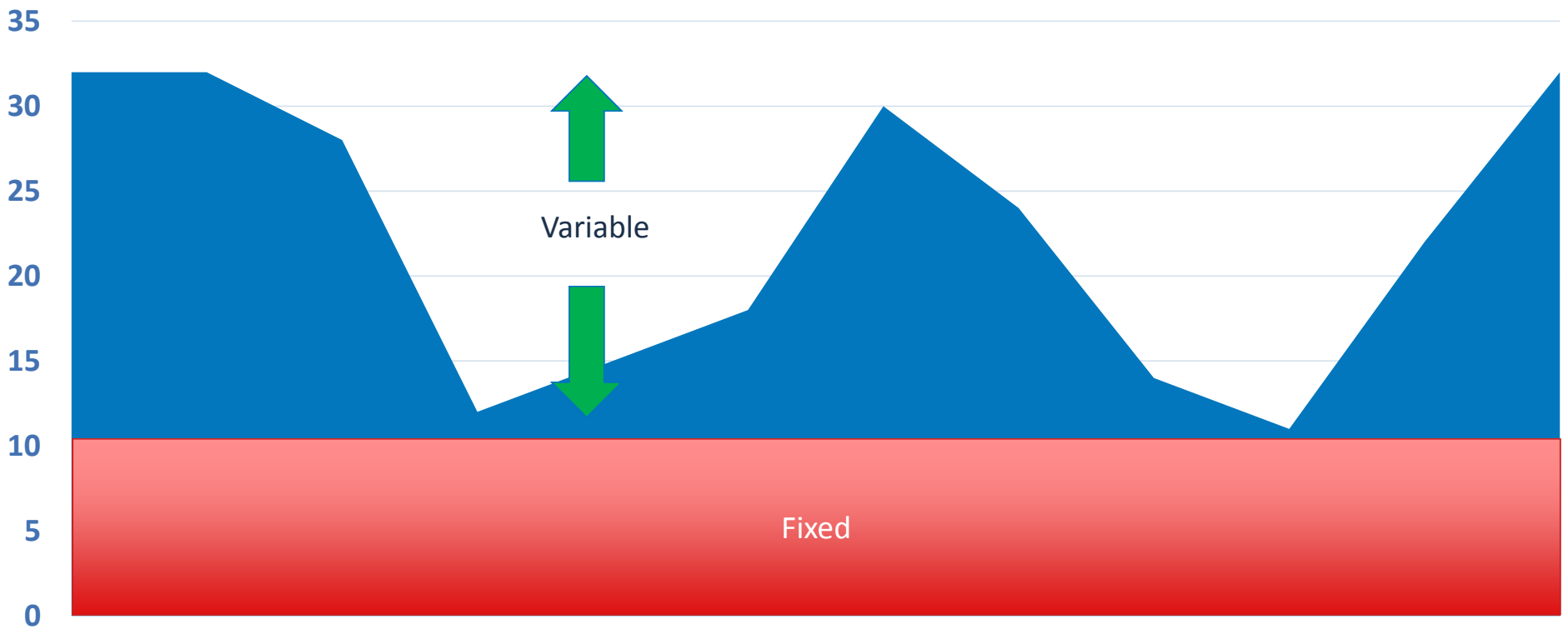
Buying Cloud

- Models:
  - Per user
  - Per item e.g., server, gigabyte
  - Per transaction
- Timeframes:
  - Pay upfront for fixed/reserved capacity
  - Pay afterward based on actual usage
- Levers:
  - Volume
  - Performance
  - Length of commitment

Example 1



Example 1



On-Demand Pricing

On-Demand instances let you pay for compute capacity by the hour with no long-term commitments. This frees you from the costs and complexities of planning, purchasing, and maintaining hardware and transforms what are commonly large fixed costs into much smaller variable costs.

Linux | RHEL | SLES | Windows | Windows with SQL Standard | Windows with SQL Web | Windows with SQL Enterprise

Region: US East (N. Virginia)

	vCPU	ECU	Memory (GiB)	Instance Storage (GB)	Linux/UNIX Usage
General Purpose - Current Generation					
t2.nano	1	Variable	0.5	EBS Only	$0.0065 per Hour
t2.micro	1	Variable	1	EBS Only	$0.013 per Hour
t2.small	1	Variable	2	EBS Only	$0.026 per Hour
t2.medium	2	Variable	4	EBS Only	$0.052 per Hour
t2.large	2	Variable	8	EBS Only	$0.104 per Hour
m4.large	2	6.5	8	EBS Only	$0.12 per Hour
m4.xlarge	4	13	16	EBS Only	$0.239 per Hour

Reserved Instance Payment Options

You can choose between three payment options when you purchase a Standard or Convertible Reserved Instance. With the **All Upfront** option, you pay for the entire Reserved Instance term with one upfront payment. This option provides you with the largest discount compared to On-Demand instance pricing. With the **Partial Upfront** option, you make a low upfront payment and are then charged a discounted hourly rate for the instance for the duration of the Reserved Instance term. The **No Upfront** option does not require any upfront payment and provides a discounted hourly rate for the duration of the term.

Linux | RHEL | SLES | Windows | Windows with SQL Standard | Windows with SQL Web | Windows with SQL Enterprise

Region: US East (N. Virginia)

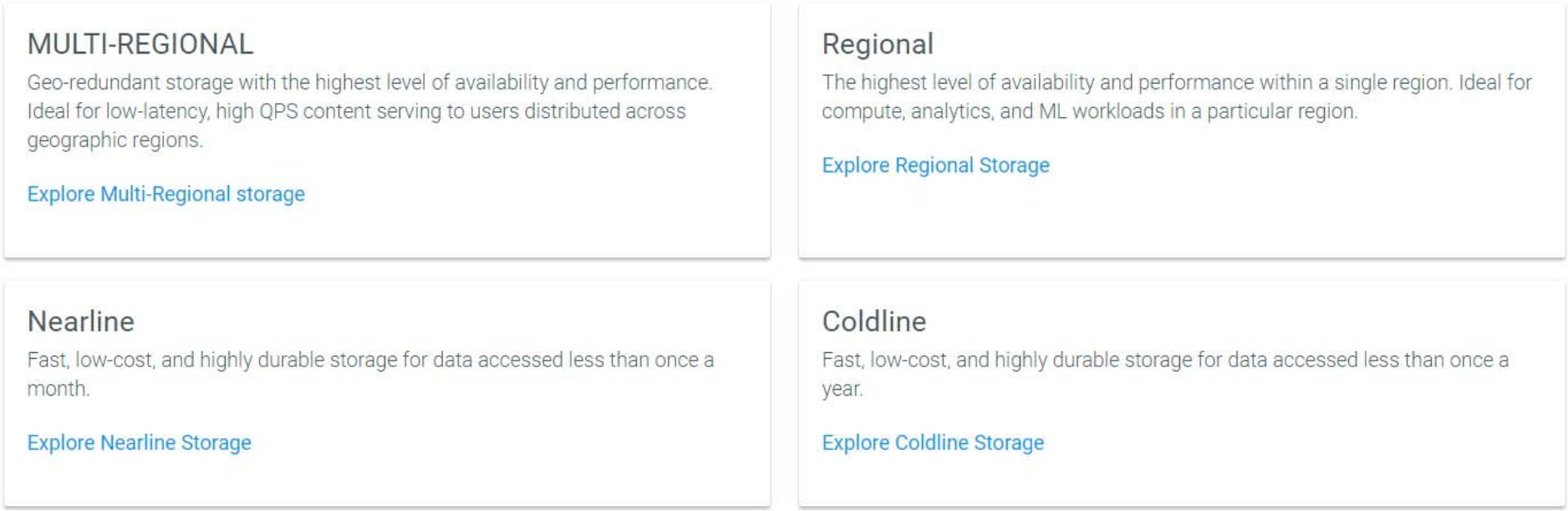
t2.nano

STANDARD 1-YEAR TERM					
Payment Option	**Upfront**	**Monthly***	**Effective Hourly****	**Savings over On-Demand**	**On-Demand Hourly**
No Upfront	$0	$3.29	$0.005	31%	$0.0065 per Hour
Partial Upfront	$25	$1.10	$0.004	32%	
All Upfront	$38	$0.00	$0.004	34%	

STANDARD 3-YEAR TERM					
Payment Option	**Upfront**	**Monthly***	**Effective Hourly****	**Savings over On-Demand**	**On-Demand Hourly**
Partial Upfront	$54	$0.73	$0.003	52%	$0.0065 per Hour
All Upfront	$76	$0.00	$0.003	55%	

Example 2

- So you want to buy cloud storage…



Example 2

- So you want to buy cloud storage…

Multi-Regional Storage (per GB per Month)	Regional Storage (per GB per Month)	Nearline Storage (per GB per Month)	Coldline Storage (per GB per Month)
$0.026	$0.02	$0.01	$0.007

Example 2

- Network

  Egress*

  US

Monthly Usage	Network (Egress) Worldwide Destinations (excluding China & Australia, but including Hong Kong) (per GB)	Network (Egress) China Destinations (excluding Hong Kong) (per GB)	Network (Egress) Australia Destinations (per GB)	Network (Ingress)
0-1 TB	$0.12	$0.23	$0.19	Free
1-10 TB	$0.11	$0.22	$0.18	Free
10+ TB	$0.08	$0.20	$0.15	Free

Example 2

Data retrieval

- Reading Nearline Storage data incurs a cost of $0.01 per GB.
- Reading Coldline Storage data incurs a cost of $0.05 per GB.

Early deletion

- Nearline Storage data that is deleted less than 30 days after creation incurs a minimum 30-day charge.
- Coldline Storage data that is deleted less than 90 days after creation incurs a minimum 90-day charge.

  For example, suppose you store 1,000 GB of Coldline Storage data in a US region. If you add the data on day 1 and then remove it on day 60, you are charged $14 ($0.007/GB/mo. * 1,000 GB * 2 mo.) for storage from day 1 to 60, and then $7 ($0.007/GB/mo. * 1,000 GB * 1 mo.) for 30 days of early deletion from day 61 to 90.

Buying Cloud

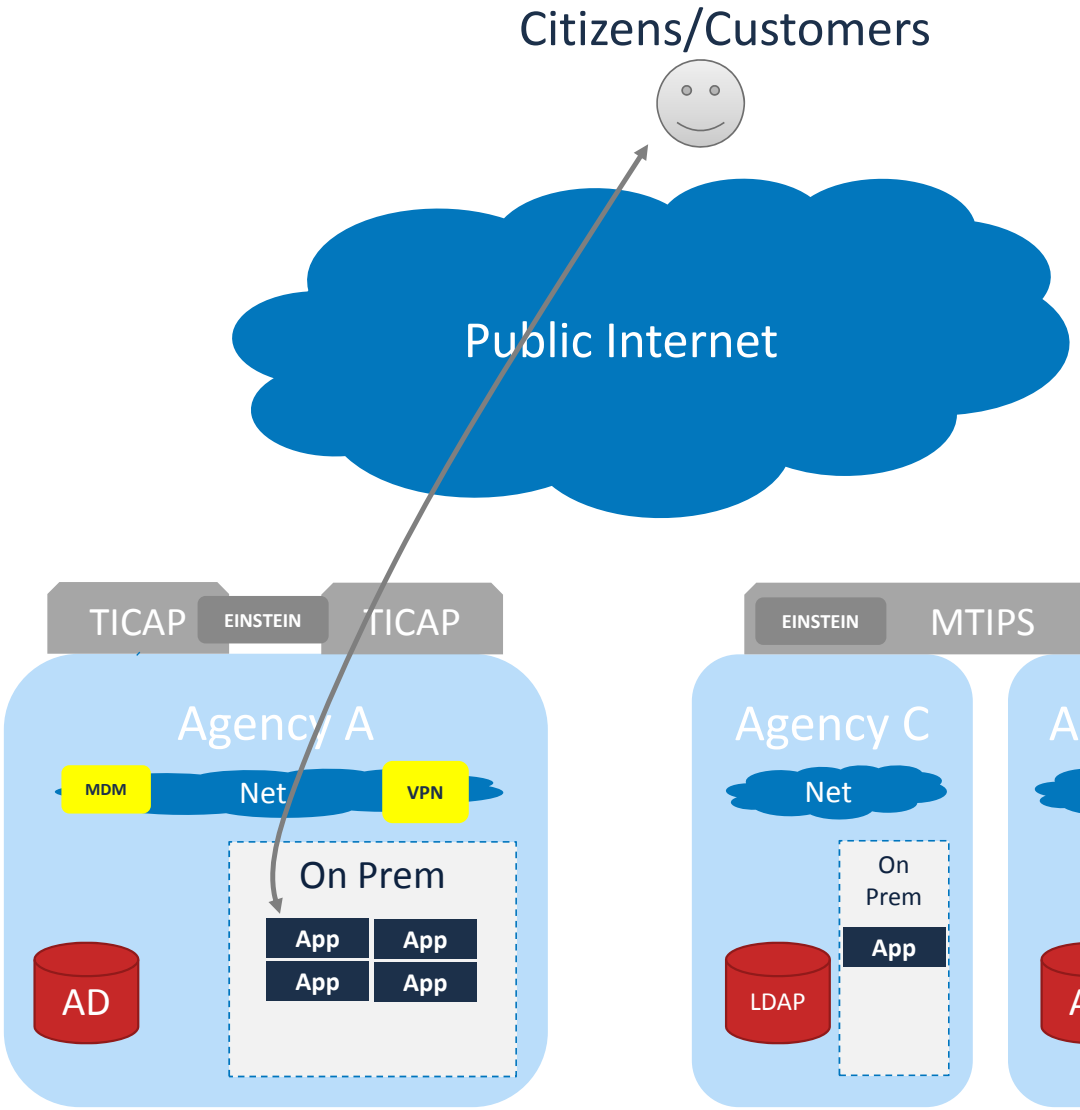
- Can be complex…
- However, this complexity better reflects the underlying costs of the cloud provider (reality is often more complex)

Tips

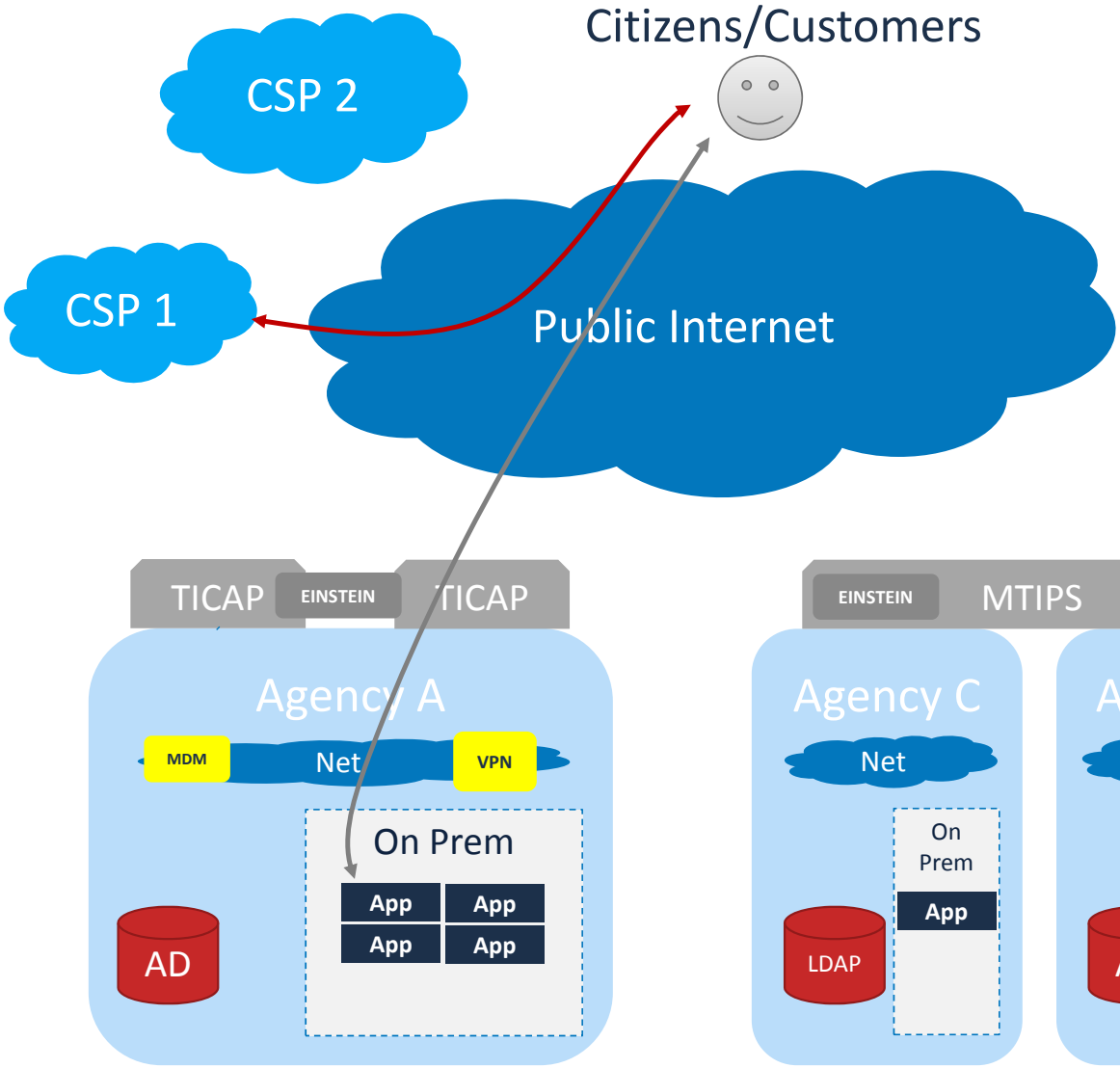
- Leverage vendor ‘pricing calculators’
- Pay close attention to your pricing levers:
  - Volume
  - Performance
  - Length of commitment
- Unlike traditional enterprise software vendors, cloud vendors will often let you allow you scale up from a few dollars/month to millions/month => take advantage of this!
  - Consider based set of functionality/usage and provide the business mechanism to unlock incremental additional chunks of financing as requirements change

Architecture

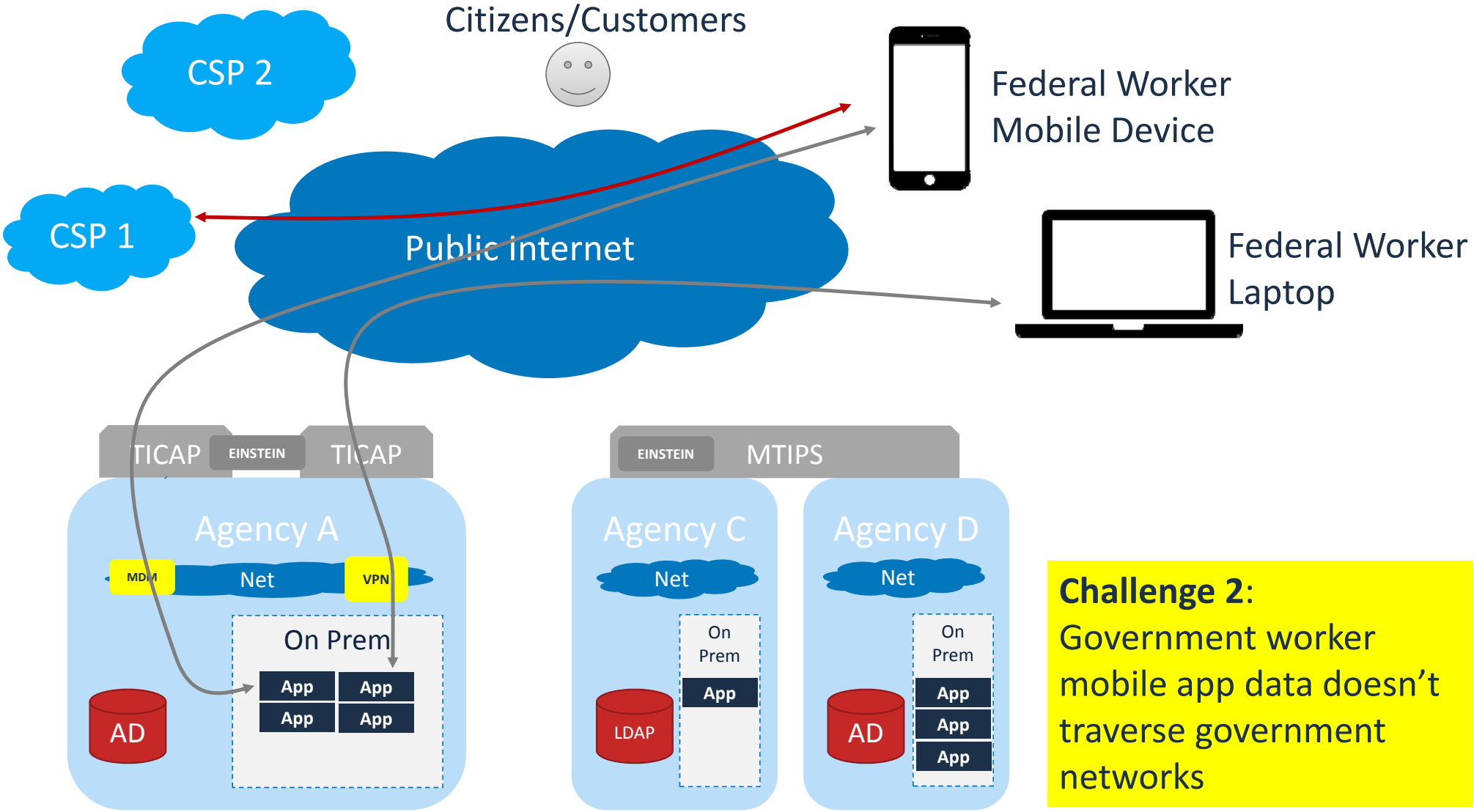
- The cloud can pose an architectural challenge for some department and agency networks and security models



This is generally how citizen-facing services worked before the cloud…



Challenge 1: Public-facing services delivered via CSPs don't traverse a government networks



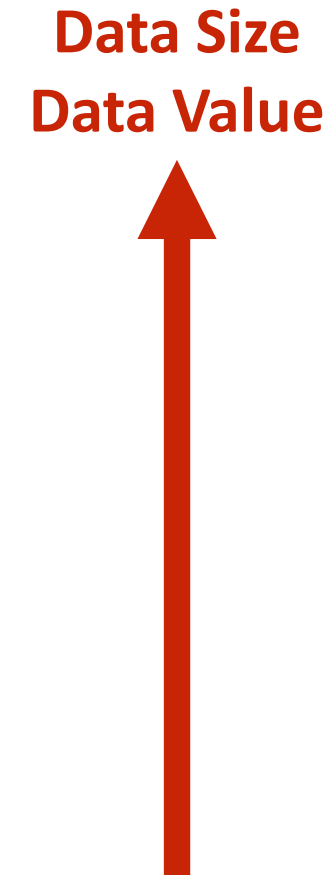
Challenge 2:
Government worker mobile app data doesn't traverse government networks

Security

- What is different in security model for cloud services?
  - It partly depends on the type of service (IaaS/PaaS/SaaS)
- Fundamental difference is that we must rely upon CSP to implement compensating controls
  - How do we assess?

Data-centric View of Security

1. **End hosts** – e.g. Antivirus, host monitoring
2. **Logs** – e.g. applications, servers, containers
3. **Network** – e.g. netflow, full packets, etc. from routers and taps



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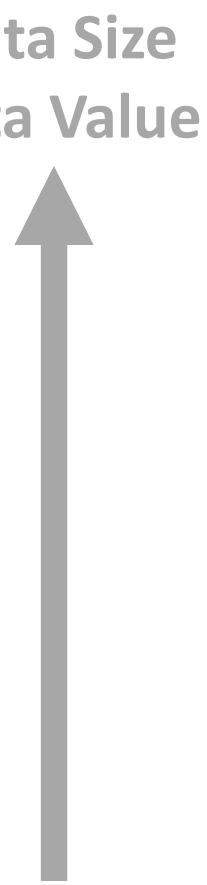
TIC/EINSTEIN operate here



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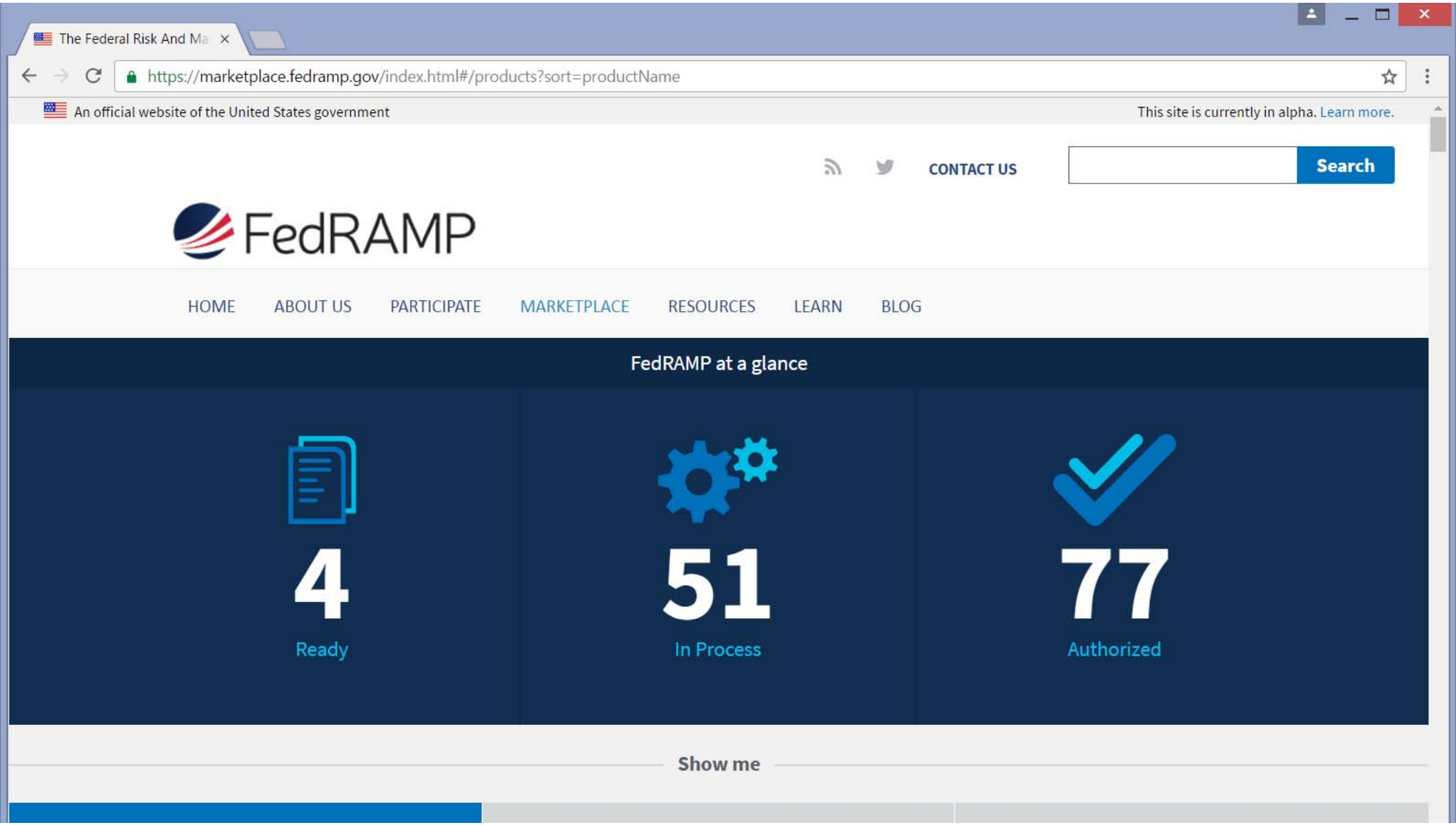
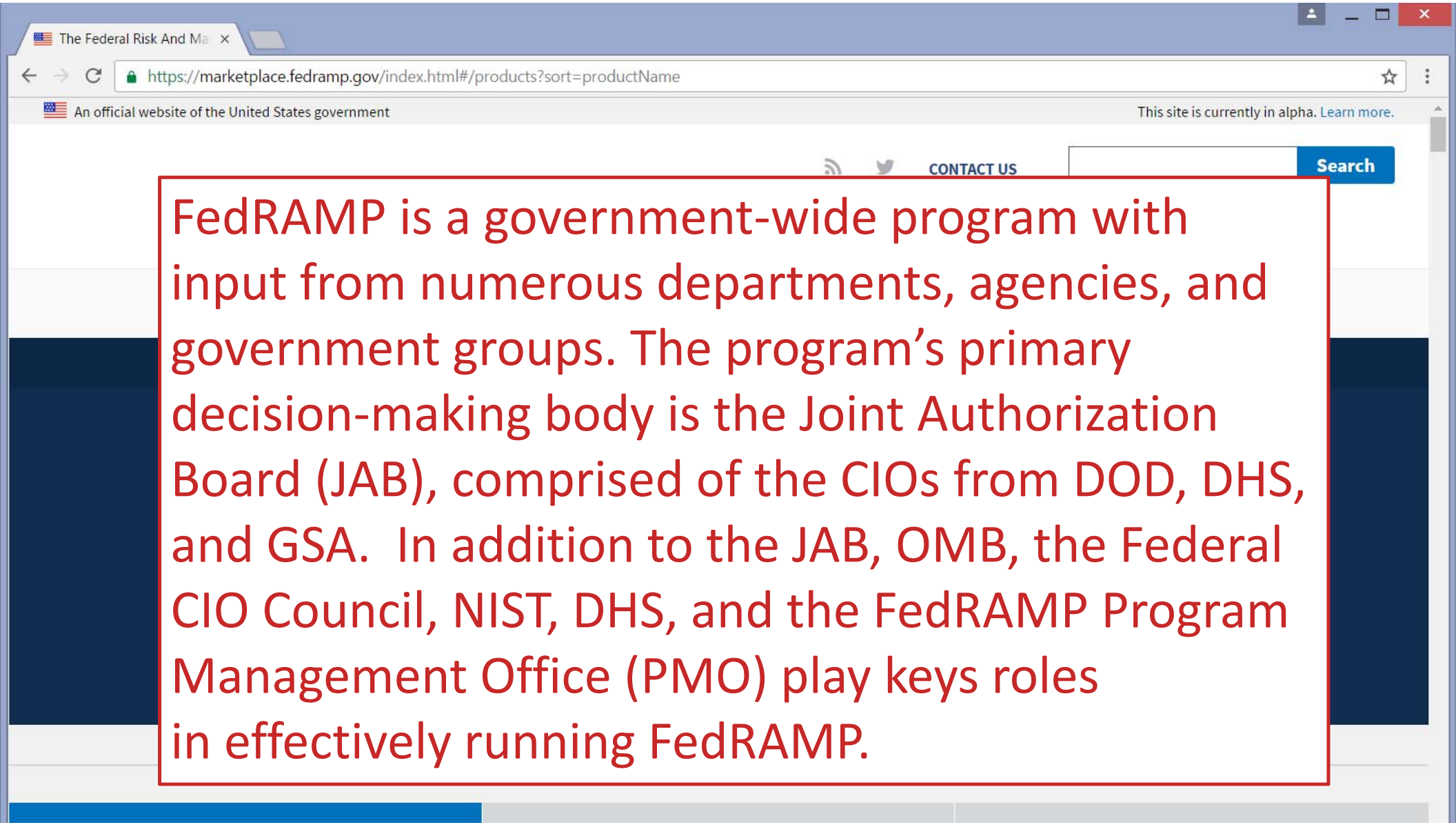

The Federal Risk And Ma
https://marketplace.fedramp.gov/index.html#/products?sort=productName
An official website of the United States government
This site is currently in alpha. Learn more.
CONTACT US
Search
FedRAMP
HOME
ABOUT US
PARTICIPATE
MARKETPLACE
RESOURCES
LEARN
BLOG
FedRAMP at a glance
4
Ready
51
In Process
77
Authorized
Show me


The Federal Risk And Ma
https://marketplace.fedramp.gov/index.html#/products?sort=productName
An official website of the United States government
This site is currently in alpha. Learn more.
CONTACT US
Search
FedRAMP is a government-wide program with input from numerous departments, agencies, and government groups. The program's primary decision-making body is the Joint Authorization Board (JAB), comprised of the CIOs from DOD, DHS, and GSA. In addition to the JAB, OMB, the Federal CIO Council, NIST, DHS, and the FedRAMP Program Management Office (PMO) play keys roles in effectively running FedRAMP.

OMB - MAX.gov Shared Services

FedRAMP Ready | FedRAMP In Process | FedRAMP Autho

FedRAMP Authorized Since 06/09/2014

3
Authorizations

System Profile

Service Models
PaaS, SaaS

Deployment Model
Government Community Cloud

Impact Level
Moderate

Contact Information

POC: N/A
E-mail: MAXSupport@om
Website: www.max.gov

FedRAMP Authorization Timeline

12/03/2013	06/09/2014
In-Process	Authorized

Service Description +

Additional products from this provider

MAX General Support Services

Agencies using this service

Defense Information Systems Agency
Department of Defense
Executive Office of the President
Office of Management and Budget
United States Office of Government Ethics

Package ID

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ATOs

- Securing the cloud often means securing the **configuration** and **data** not the infrastructure
  - Plan for worst case and follow NIST Framework
- Leverage FedRAMP JAB/agency ATOs where you can
- Your use case is likely similar to other D/As, work together to save time

Discussion

- The cloud is here and will likely grow more powerful and cost effective over time
- What is your biggest concern about the cloud?
- What uses cases are not right for the cloud?
- How will ML/AI and other trends impact the cloud?