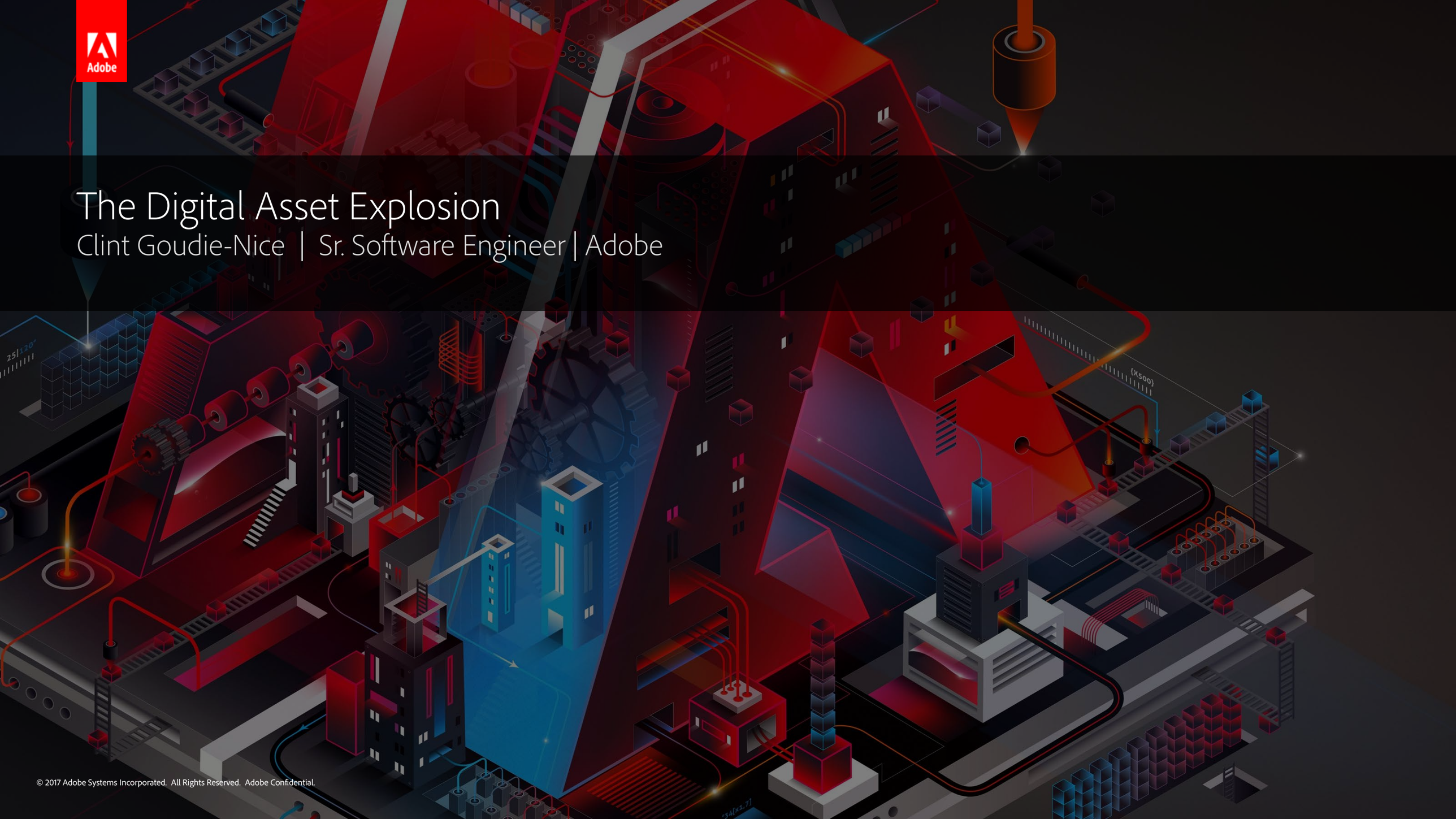
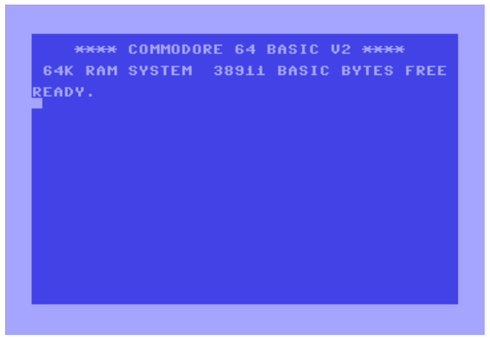
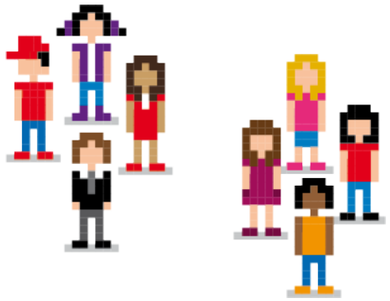
The Digital Asset Explosion

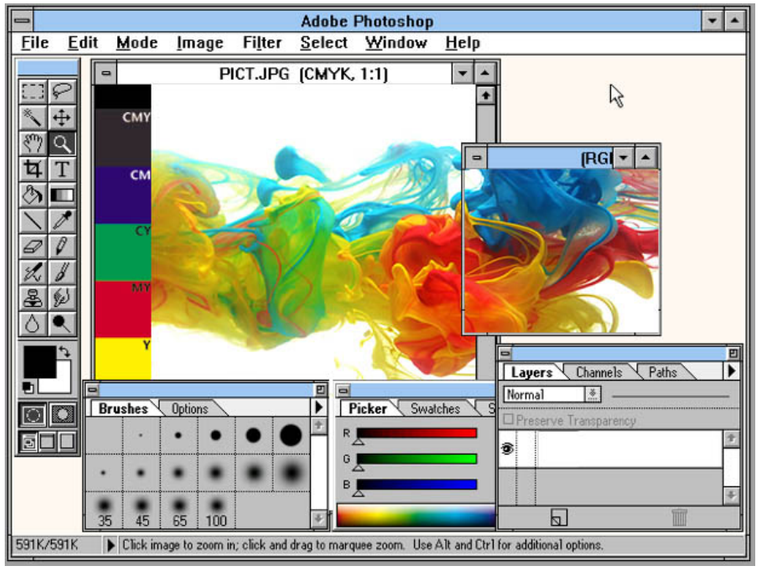
Clint Goudie-Nice | Sr. Software Engineer | Adobe



The landscape of digital assets has changed over time, always larger







At Adobe, we are seeing an explosion in digital assets in 4 key areas:

- The file size of digital assets being produced
- The number of digital assets being produced
- The expectations of our users and customers for digital assets
- The requests for larger and larger AEM Assets deployments

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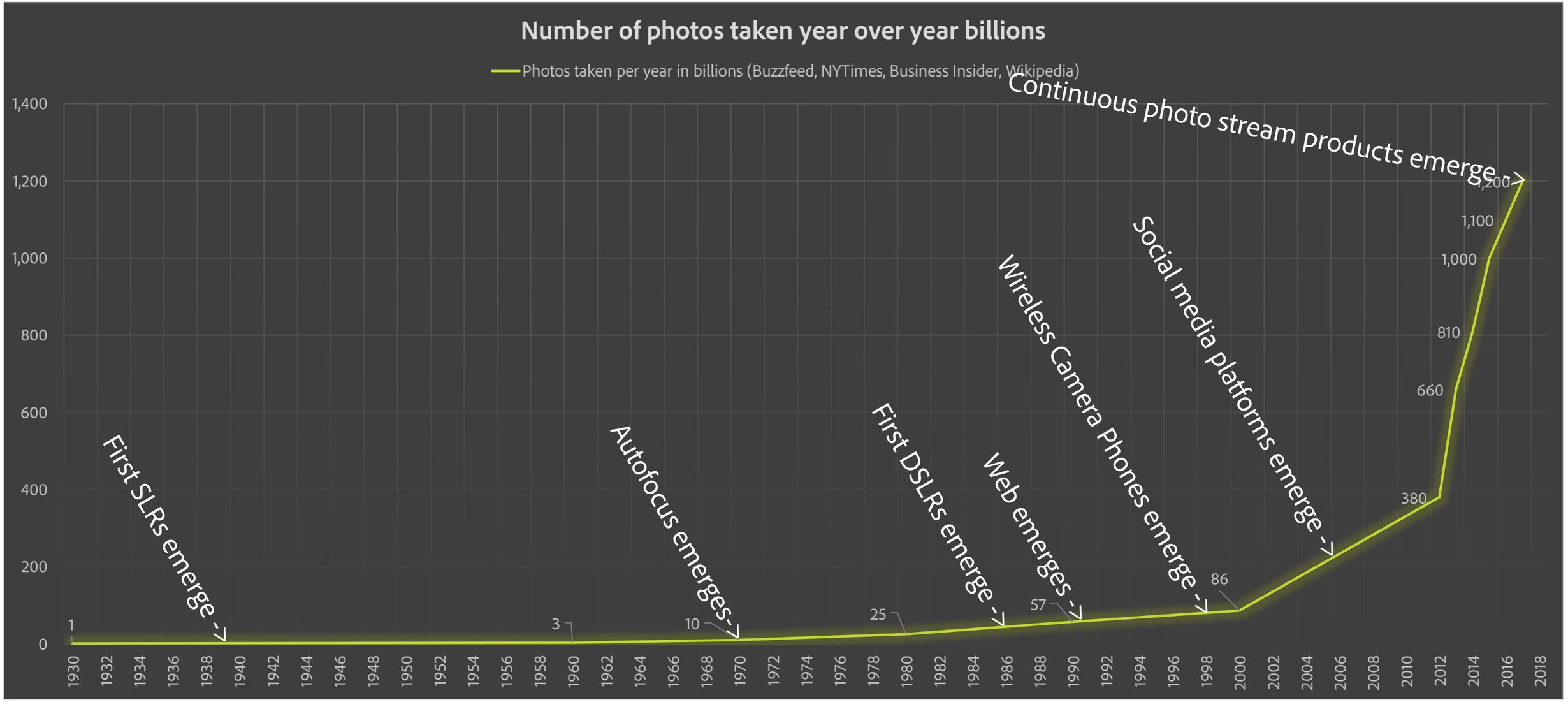
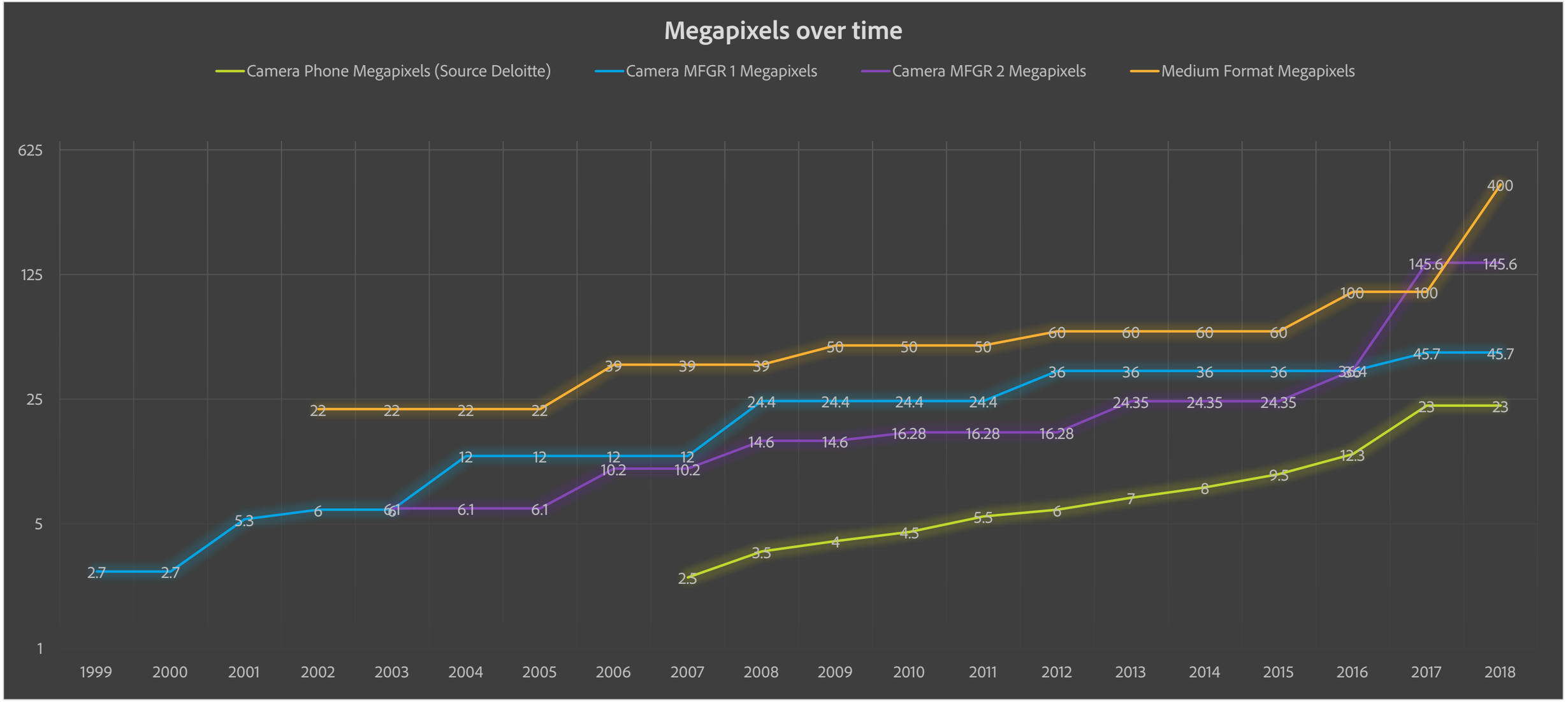
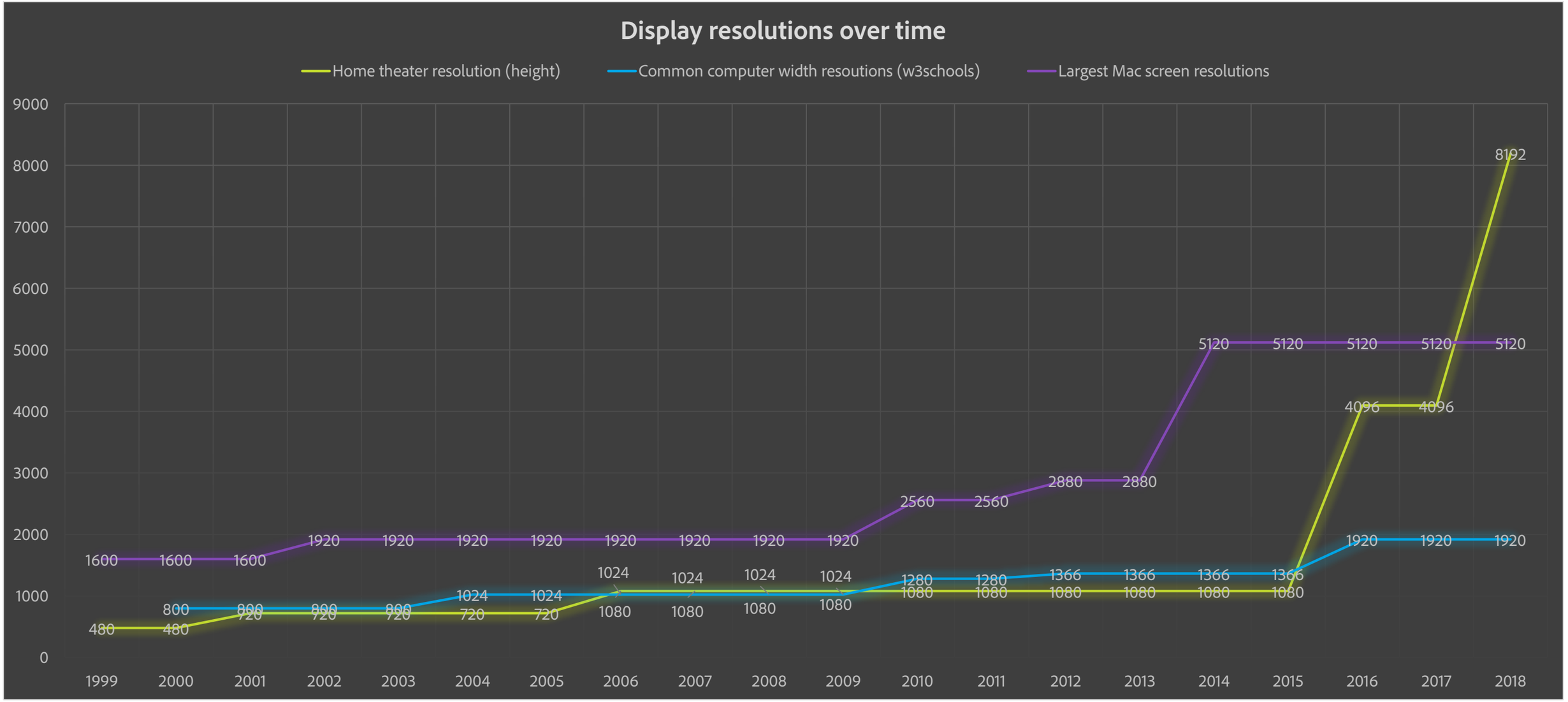
Volume of digital assets:



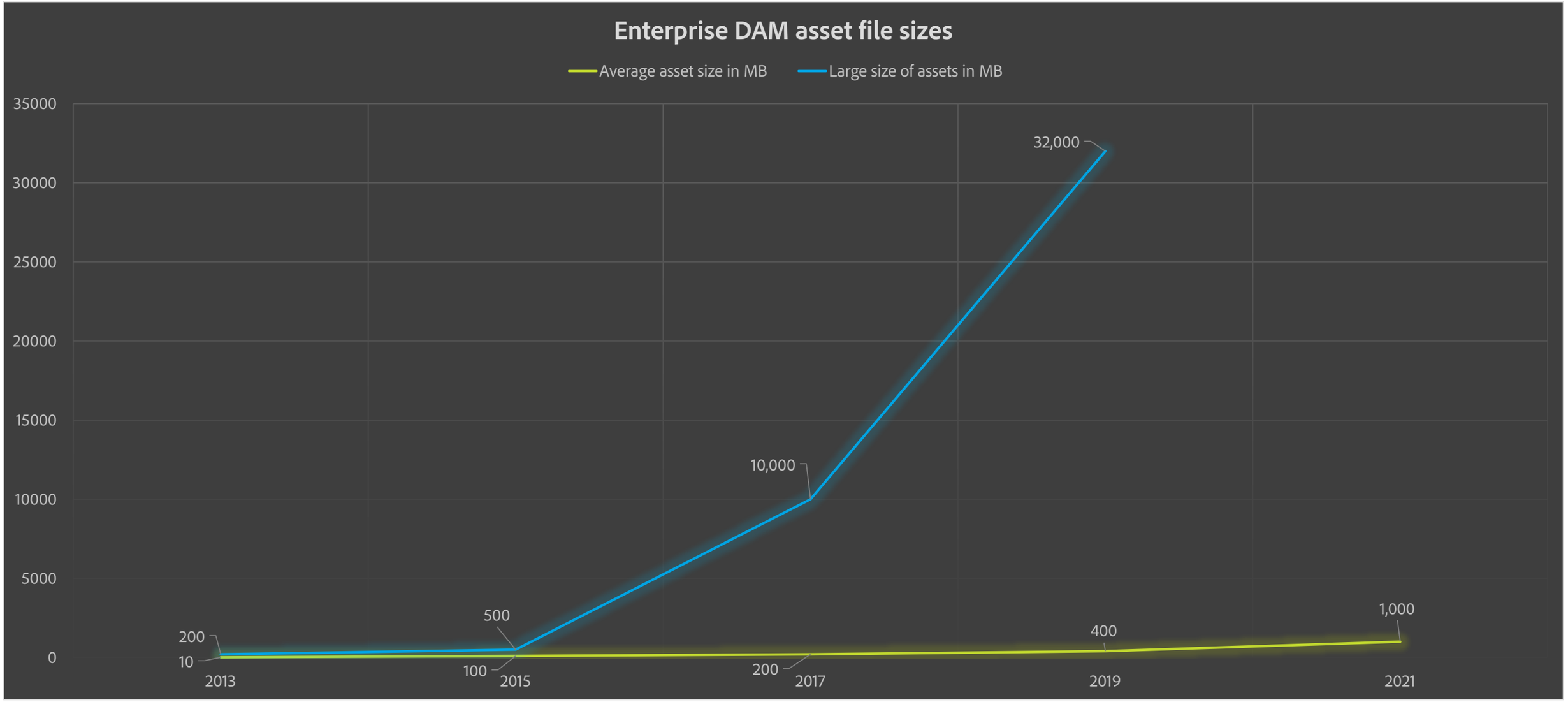
Digital cameras, more pixels



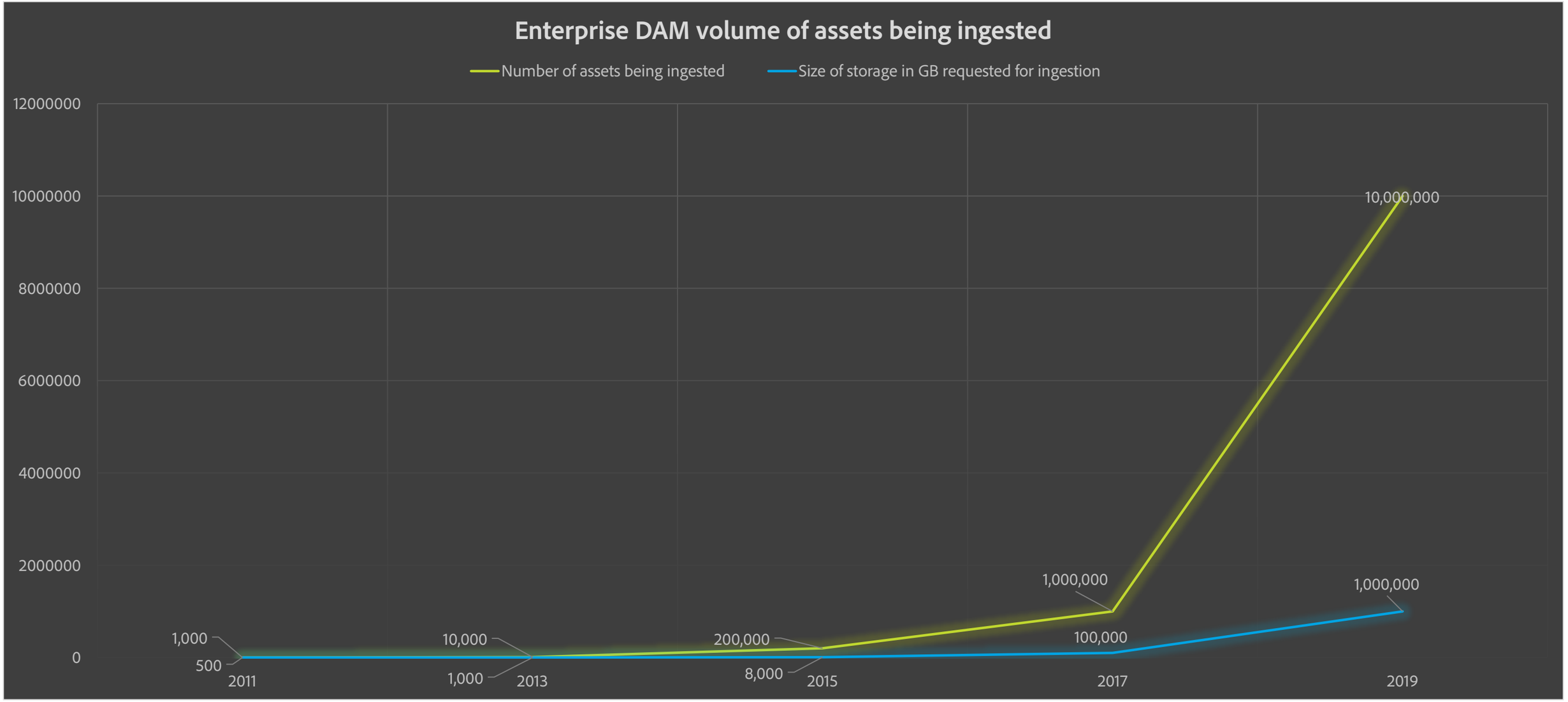
Screen resolutions increasing



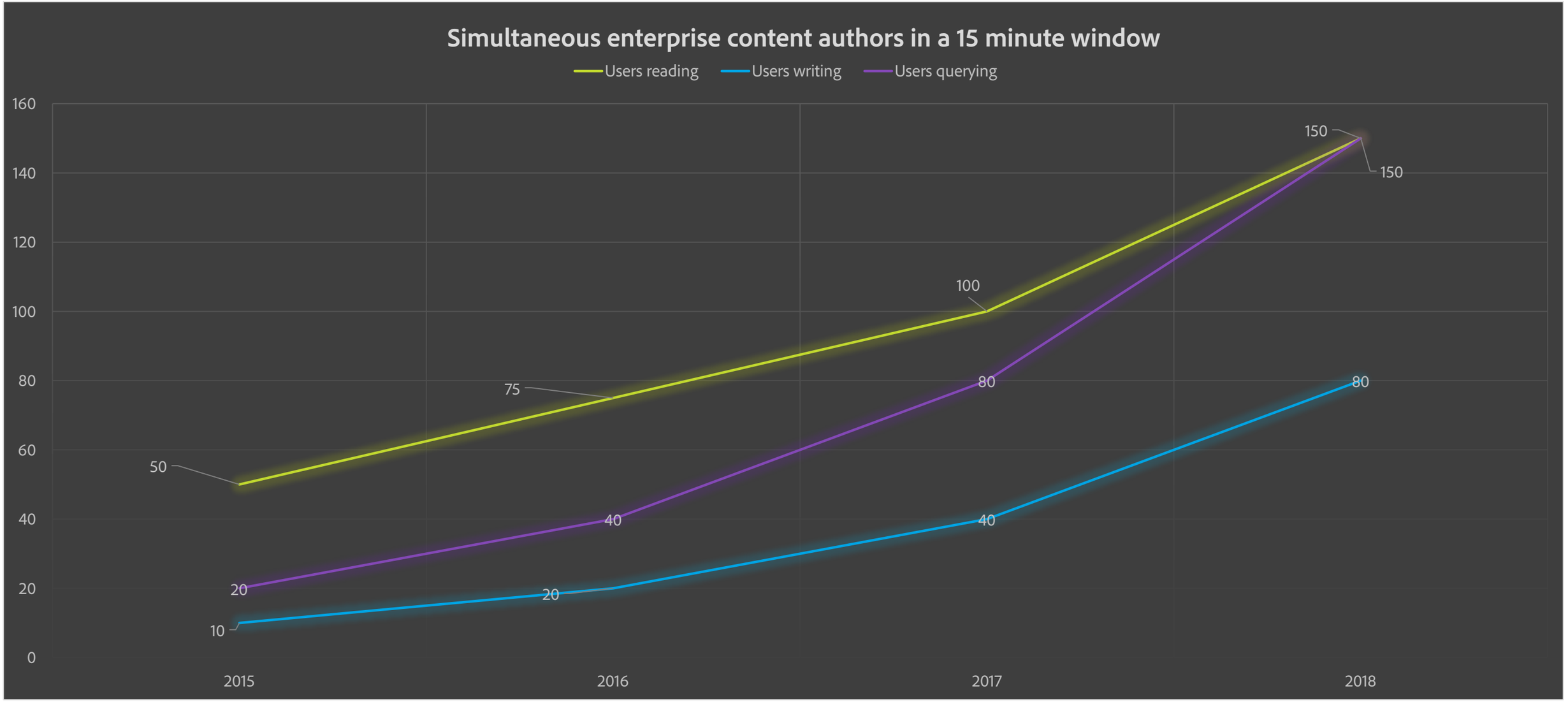
AEM Assets customers are leading the charge in file size



AEM Assets customers are leading the charge in volume



AEM Assets customers are leading the charge in disk IO and network IO



What are enterprises doing with these assets?

- Targeted experiences for customers and employees
- Storing master digital assets at the highest resolutions
- Storing a legacy of content from everywhere to make it **addressable and actionable**

Digital Transformation is changing the game

Digital transformation, content velocity, and delivering relevant experiences has resulted in an ever increasing size of a master asset as well as the need for more assets.

- File size has evolved significantly
  - 2-3 years ago: 10-20MB
  - Today: 100-500MB
  - **Tomorrow: 20GB +**
- Number of assets has evolved significantly
  - 2-3 years ago: 10's of thousands
  - Today: 100's of thousands
  - **Tomorrow: millions**

What is Adobe seeing from our largest AEM Asset customers?

- Trending toward 30 million addressable pieces of content.
- 15,000 new pieces of content added daily
- 150,000 pieces of content downloaded daily
- 400TB of digital asset content.

How do we handle this Digital Asset Explosion?

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How do we handle this Digital Asset Explosion?

1

Help
Understand
topologies

2

Provide
Operational guidance

3

AEM 6.3,
Continued research

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As assets explode, what's the same?

Irrespective of location, network connectivity, and asset size,
our customers expect the same user experience.

As assets explode, what isn't keeping up?

Priority

1. The customer's network bandwidth, including WiFi
2. Server Disk IO

   Individual spinning hard disks are not useful for large deployments.
3. Server RAM

   Unused RAM improves Disk IO
4. Server CPU

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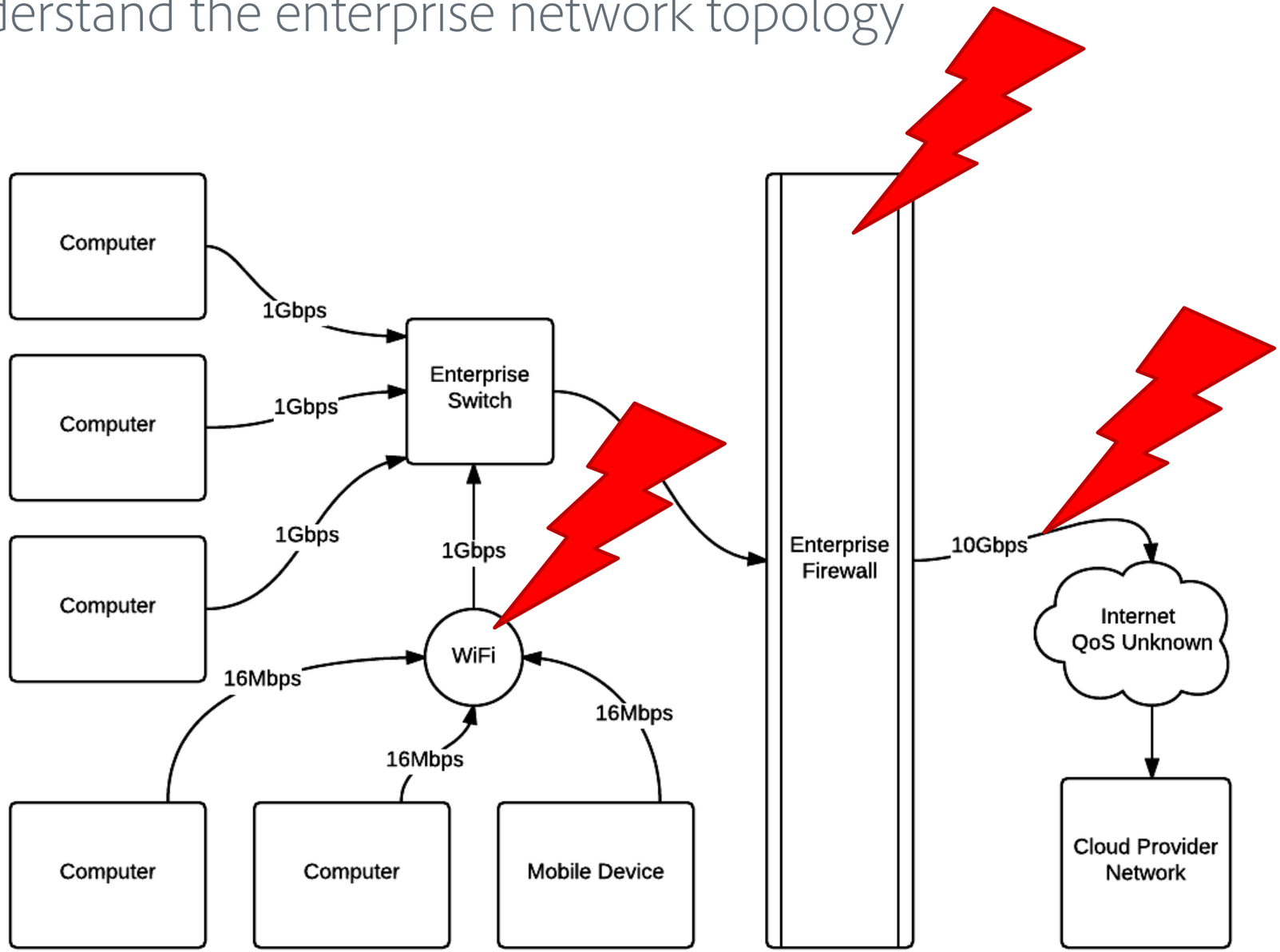
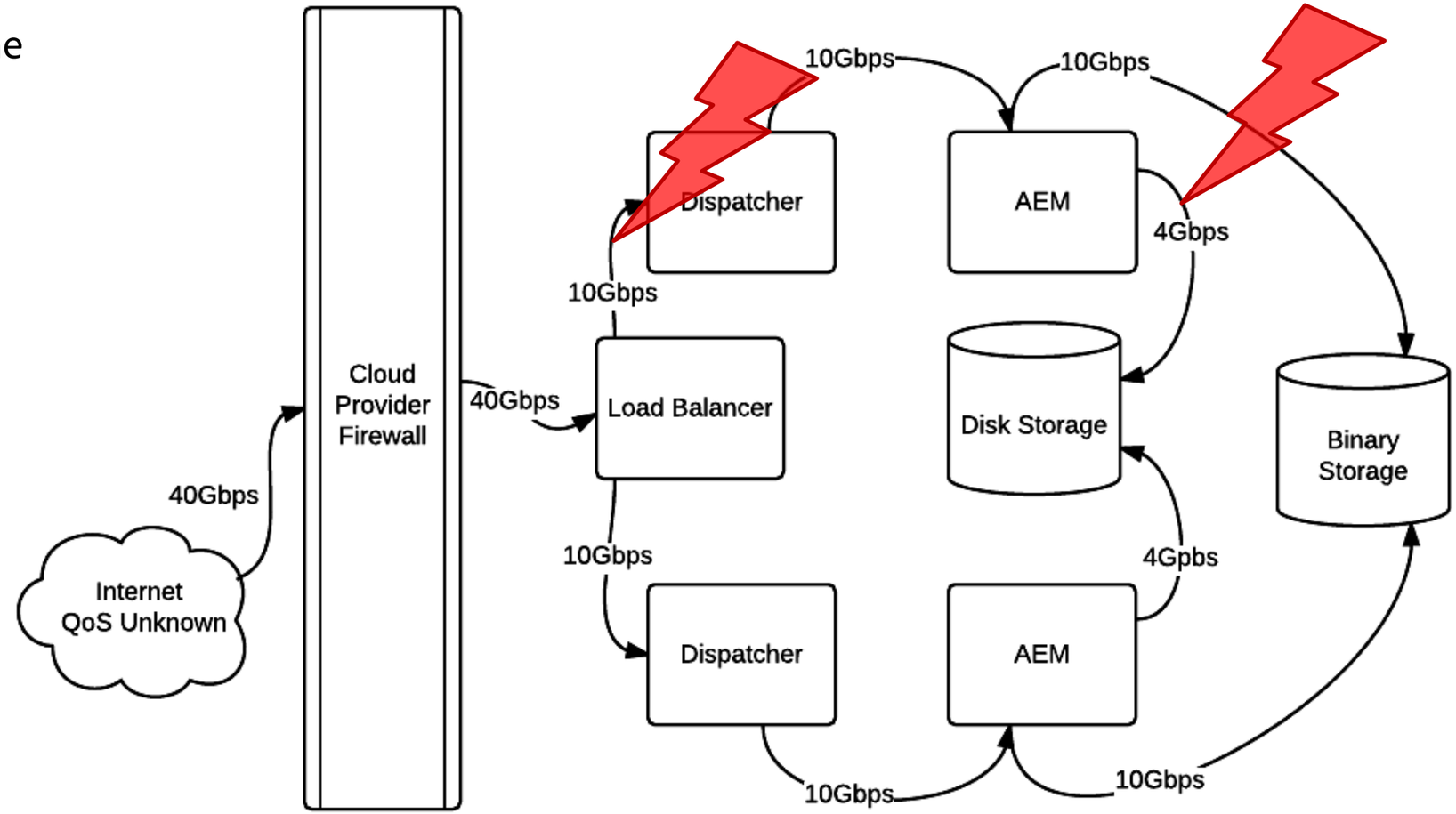
Bandwidth: Understand the enterprise network topology



Bandwidth: Understand the enterprise network topology

- Adobe Managed Services can remove the complexity of sizing in the cloud, and handle these sections for you.



We used to talk about bandwidth and the last mile. The problem has returned.

56 kbit/s	Modem / Dialup	<--- 90's era dialup
1.5 Mbit/s	ADSL Lite	
1.544 Mbit/s	T1/DS1	
2.048 Mbit/s	E1 / E-carrier	
4 Mbit/s	ADSL1	
10 Mbit/s	Ethernet	<--- Most individual users upload speeds usually falls here
11 Mbit/s	Wireless 802.11b	
24 Mbit/s	ADSL2+	
44.736 Mbit/s	T3/DS3	
54 Mbit/s	Wireless 802.11g	<--- Enterprise WiFi, shared among many users
100 Mbit/s	Fast Ethernet	<--- Some enterprises uplinks fall here, shared among all users
155 Mbit/s	OC3	
600 Mbit/s	Wireless 802.11n	
622 Mbit/s	OC12	
1 Gbit/s	Gigabit Ethernet	<--- Most enterprises uplinks fall here, shared among all users
1.3 Gbit/s	Wireless 802.11ac	
2.5 Gbit/s	OC48	<--- Spinning hard disks in sequential read
5 Gbit/s	USB 3.0	<--- Enterprise grade SSDs in sequential read
9.6 Gbit/s	OC192	
10 Gbit/s	10 Gigabit Ethernet, SFP+, USB 3.1	<--- A few enterprises uplinks fall here
40 Gbit/s	Thunderbolt 3, QSFP	<--- Cloud provider uplinks generally top out here
100 Gbit/s	100 Gigabit Ethernet	

Poll 1

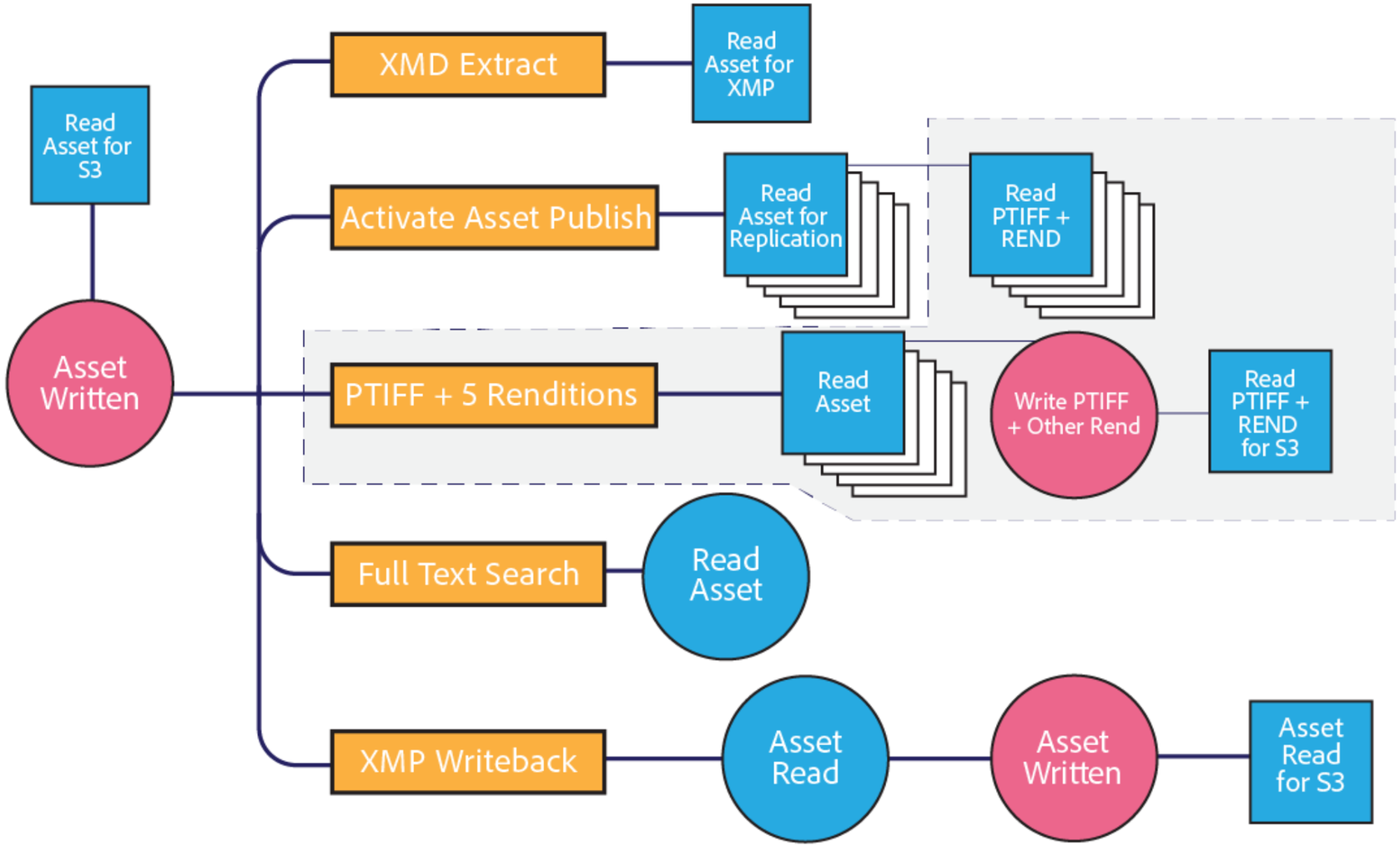
The lifecycle for an asset

1. Asset in flight. Many processes using disk IO.

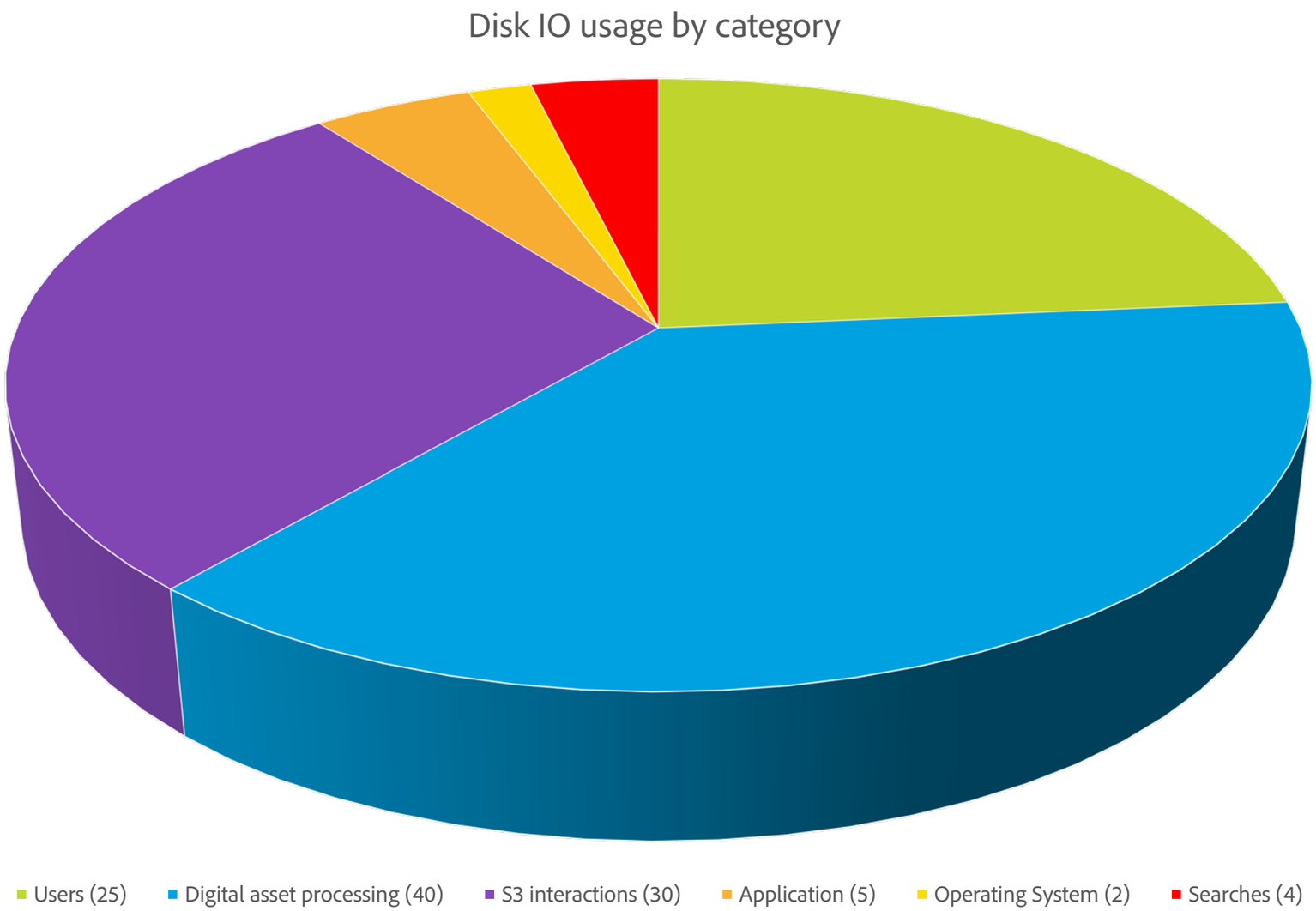
2. Asset at rest. User driven requests using infrequent disk IO.

3. Asset at archive. Rarely using disk IO.

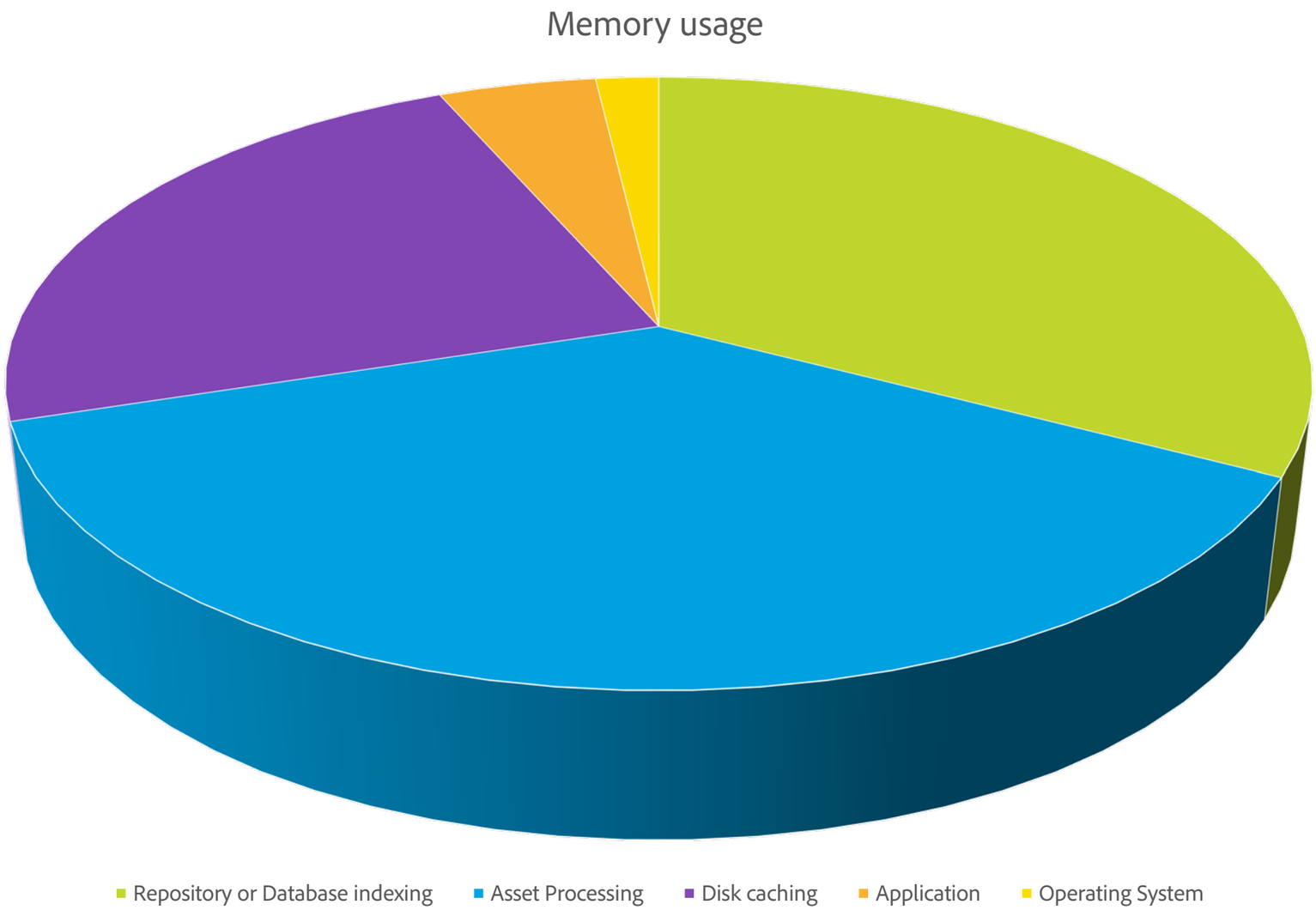
While the asset is in flight, workflow processing is a Disk IO consumer



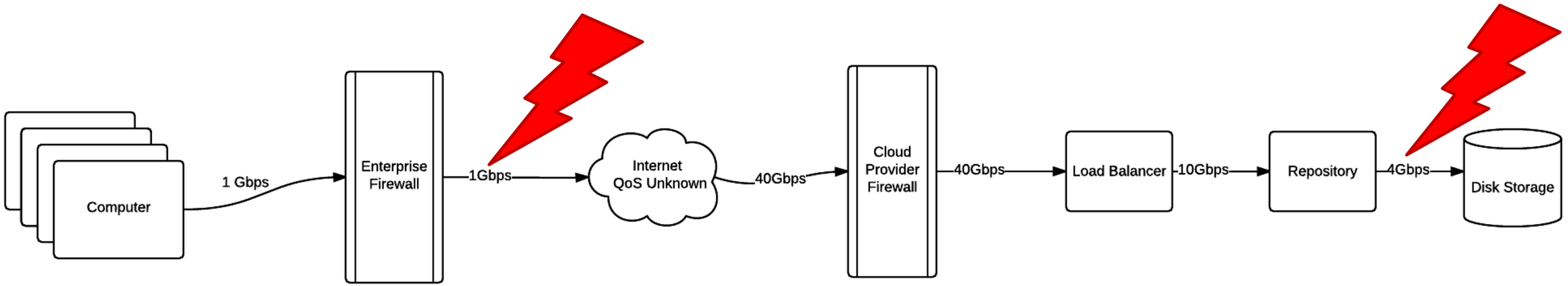
Digital assets, more server disk IO = more performance



More server RAM = more disk IO performance.



Bringing it together, the bandwidth pipeline



Poll 2

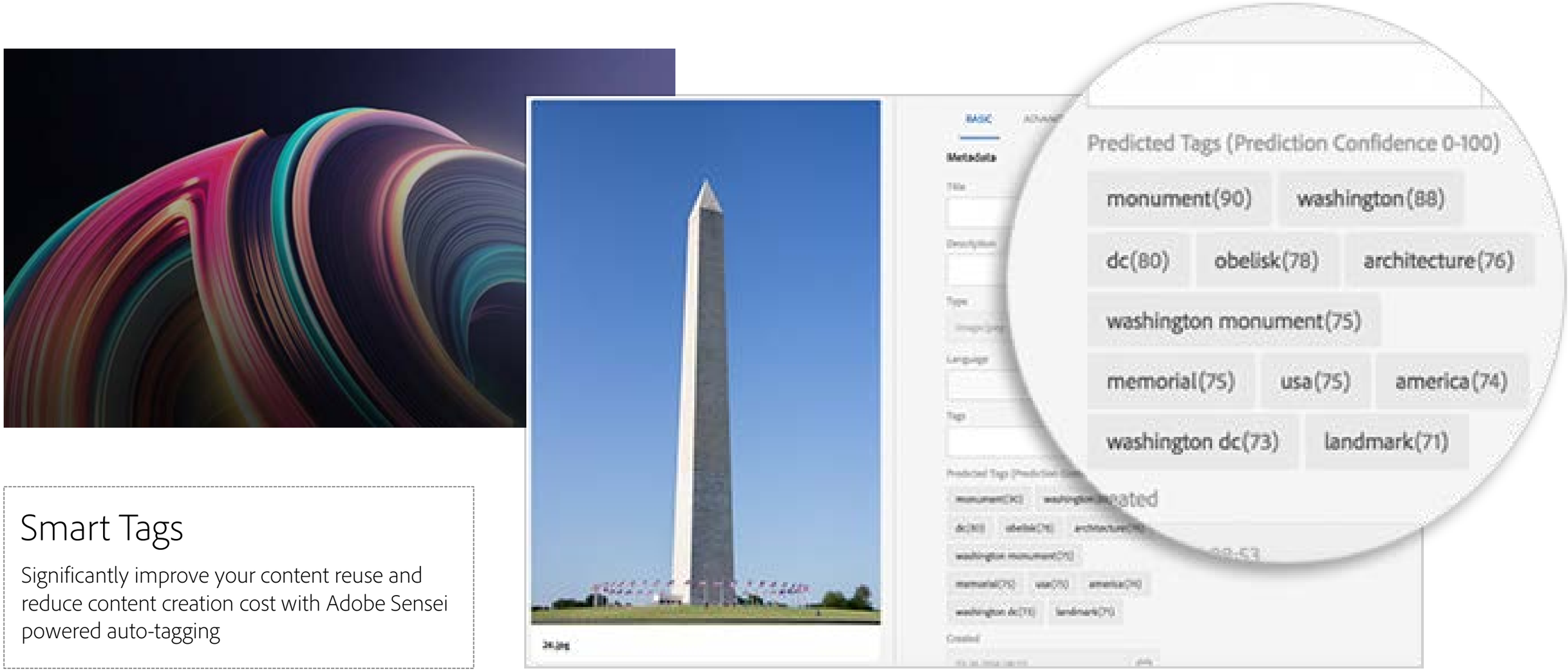
Locating relevant assets

- Tree navigation becomes inadequate as more assets are added.

- Searching quickly becomes the only method of finding assets.
  - Unindexed queries will kill your systems; authors and publishers alike.

- Basic asset metadata, filenames, and modification dates become inadequate.
  - Where possible, programmatically source metadata from the business case that generated an asset.

Adobe Sensei and AEM Smart Tagging



Smart Tags

Significantly improve your content reuse and reduce content creation cost with Adobe Sensei powered auto-tagging

See more on the power of AEM Smart Tags at https://video.tv.adobe.com/v/15600/?autoplay=true

AEM 6.2 and 6.3 Operational Documentation

- Documentation enhanced to provide best practices and guidance:
  - Assets Performance Tuning guide
  - Assets Sizing Guide
  - Assets Migration Guide
  - Assets Network Considerations
  - Assets Monitoring Guide
  - Assets Offloading Guide

- https://docs.adobe.com/docs/en/aem/6-2/administer/content/assets/best-practices-for-assets.html

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Introducing the customer: Geometrixx Fine Dining Restaurants

- I am a global restaurant chain that has followed the digital disruption to transform my business. I provide tailored experiences to my patrons and employees.

- I will use the content from AEM Assets in every part of my global operations:
  - from sourcing ingredients to meal production
  - from online menus to in restaurant ordering using mobile and AEM Screens
  - from printed billboards to TV advertising spots
  - from employee training to detailed food preparation instructions

- I am an expert at making food, but I am not an expert in technology.

Are you ready to size the environment for this enterprise?

- Sizing a an environment is an interactive dialog with your customer.
- Many sizing questions cannot be answered without engaging **Creative**, **Marketing**, and **IT**.
- The answers to these questions will evolve during the implementation.

NO

Poll 3

Forecasting requirements

A	B	C	D	E	F	G	H
	Instructions:	Replace defaults highlighted in Peach	Consider information colored in Orange	**Evaluate results in Red**		*Calculator revision 1.0.29*	
	Customer usage and replication	Minimum customer-facing network bandwidth in Mbps. This is typically the customer uplink to the internet.	Maximum simultaneous users during a 15 minute window	Average uploads per user during a 15 minute window	Average downloads per user during a 15 minute window	How many publish instances are configured?	
		1,000	10	1	5	0	
	Assets and workflows	Number of assets to ingest on an AEM instance	Average asset size in MB	Number of asset write tasks that run workflows and replication, such as watermarking. (Minimum: 1)	Number of asset write tasks that do not run workflows and replication, such as metadata write-back. (Default: 0)	Number of asset read tasks as part of non-rendition workflows, such as metadata extraction, full text Indexing, watermarking, or metadata write-back. (Default: 1)	
		10,000	100	1	0	1	
	File types and renditions	Percentage of multi-page documents such as PDF, Illustrator, EPS, etc..	Average document pages per asset when subasset extraction is enabled, otherwise 1.	Number of asset renditions configured. (Default: 4)	Average size in KB of the resulting renditions. (Generally, 100KB is the default unless high-quality renditions are configured)	Is Dynamic Media (Pyramid Tiff) enabled?	
		5%	5	4	100	FALSE	
	Instance size	Instance size recommended by the calculator	Override the recommended instance size by choosing from the drop-down list below.		All users Total disk size used by ingestion	AEM Assets Implementation T-Shirt size	
		2Gbps disk IO, 2Gbps network, 60GB ram, 16 CPU cores	Use Recommended Server Size		5.00 TB	L	
	Forecast	*Ingestion*	*User interaction*	*User interaction*	*User interaction*	*User interaction*	
		Total time required to ingest assets for all users in d:h:m:s	Data transferred per user	Single asset transfer time in d:h:m:s	Total asset transfer time per user in d:h:m:s	Server side asset processing per user in d:h:m:s	
		0:19:30:58	600.00 MB	0:00:00:20	0:00:01:52	0:00:02:19	
	User Experience Expectations	Ingestion		Single asset upload/download	Complete list upload/download	Workflow completion	
		Delighted		**Delighted**	**Delighted**	**Delighted**	

Contact your Account Executive or Account Manager for access to the Assets size forecast tool under NDA.

Have a conversation, key questions

1. Q: What is your network bandwidth?
   A: Our corporate office has a 1 gigabit uplink to the internet.

2. Q: How many creatives will be interacting with this content in a 15 minute window? How many end users?
   A: 30 content creatives. Maybe 1000 end users?

3. Q: What is the average size of your assets?
   A: 200 MB

4. Q: How many assets do you intend to upload initially?
   A: 500,000.

5. Q: Will your content creatives be using wired networking or wireless?
   A: Does it matter?

Test, Test, Test

- Use your sizing forecast as a guideline, not a result.
  - Verify your sizing strategy before purchasing fixed size production environments.
  - Test and evaluate if answers need to be revised.
  - Run internet standard speed tests from selected users' computers.
  - Stage multiple testing strategies for:
    - Functional testing
    - Performance testing
    - Live multi-user testing

Outcome? Experiences that delight.

Define a clear KPI such as:

1. Our users expect to be able to upload or download an asset in 6 seconds
2. Our users average asset size is 200 MB.
3. At peak, 15 content authors will be uploading assets.
4. At peak, 15 content authors will be downloading assets.
5. At peak, 1000 end users will be downloading published assets.

When you work with understood limitations and a clear KPI, you can adjust environments to obtain these results.

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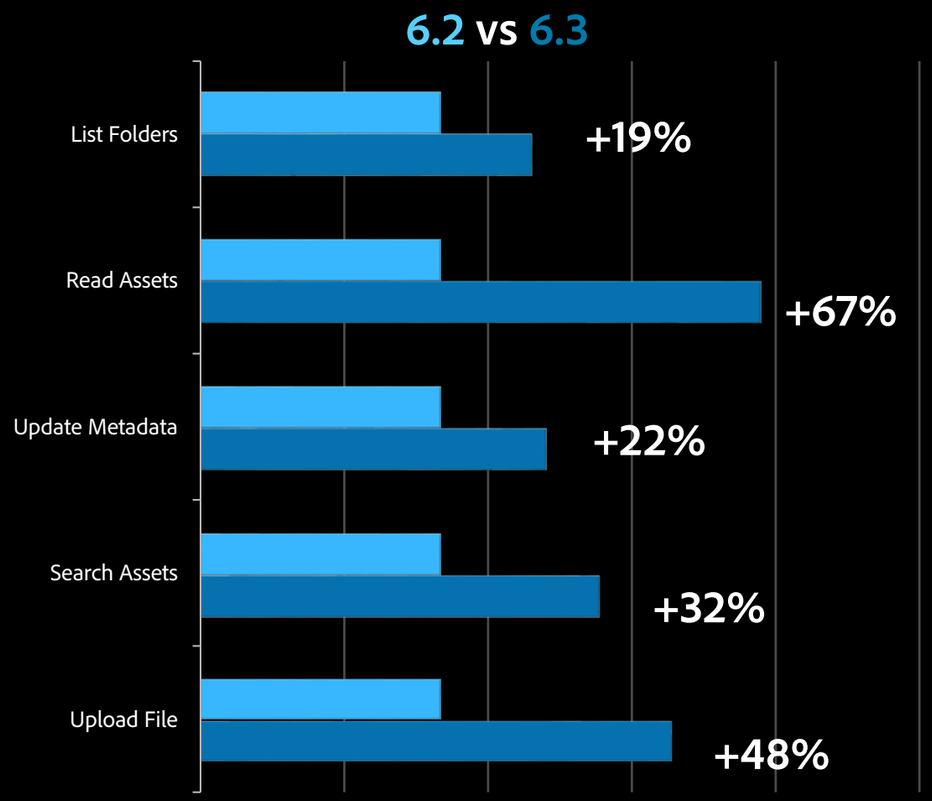
AEM Assets 6.3 Improvements

Significant improvements in performance and enterprise scale from 6.2 to 6.3

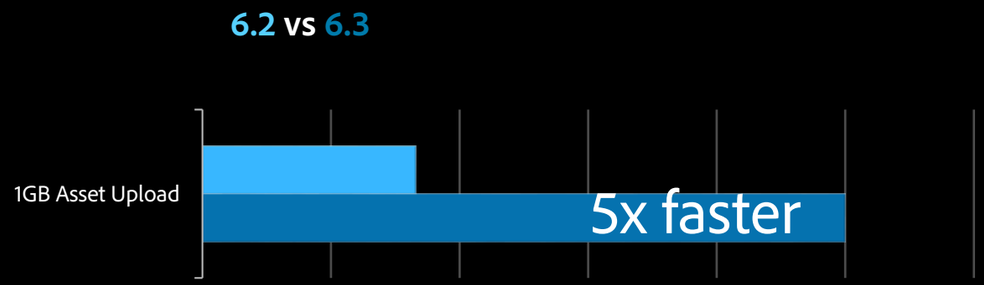
	Assets in 6.2	Assets in 6.3
Upload (Ingest)	2,500/day	15,000/day
Download	1,000/day	6,000/day
Search	7,500/day	45,000/day
Folder Browse	5,000/day	30,000/day
Metadata Read	7,500/day	15,000/day
Total Repo Size	10 TB	400 TB (1 PB EOY '17)

AEM 6.3 Performance & Scale

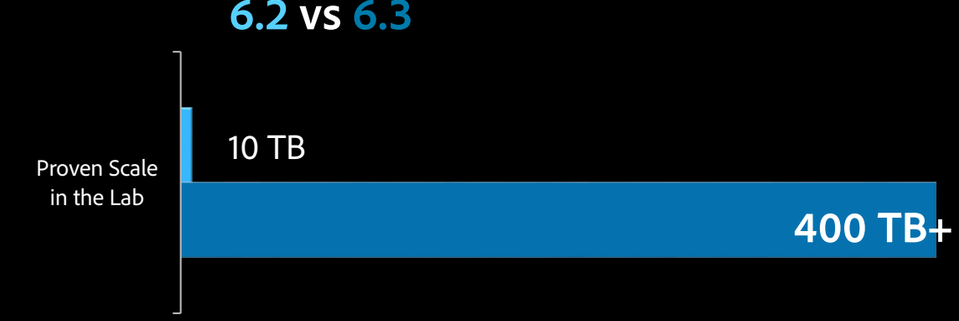
Improved for key Assets Customer Scenarios



1 GB asset upload speed is ~5x faster in 6.3



Proven Asset System scale in the lab with stable throughput and performance



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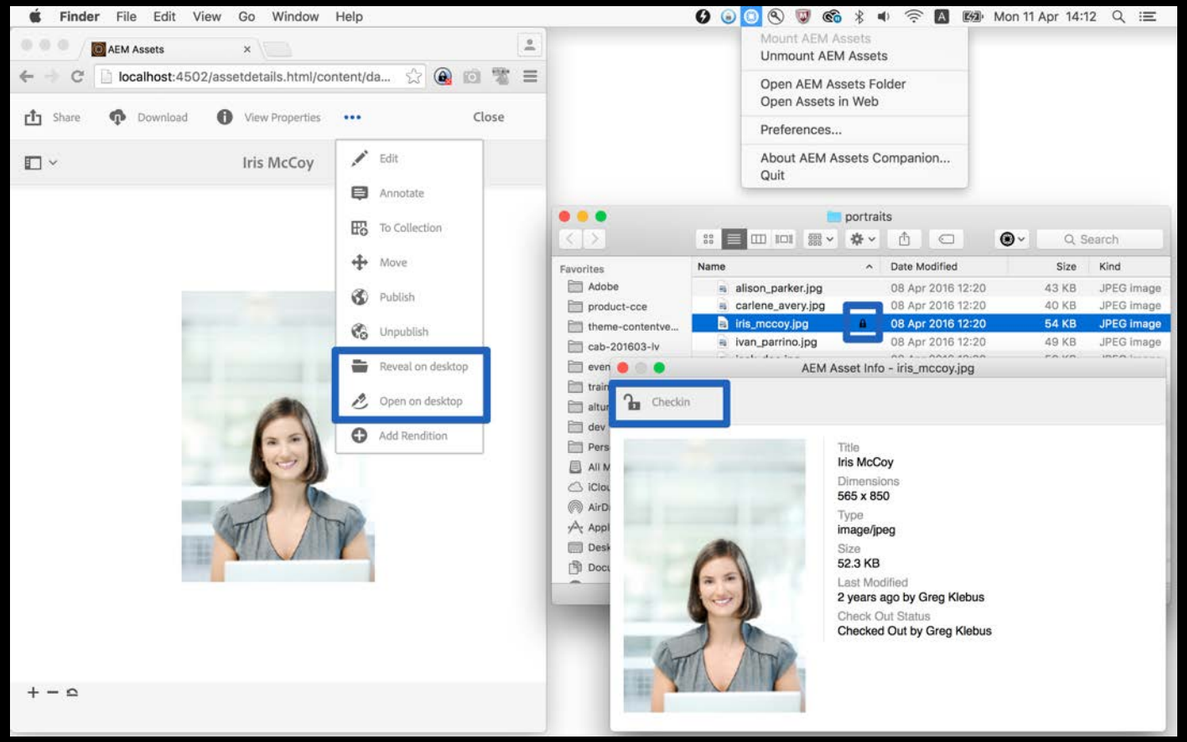
AEM Desktop App, Continued evolution



Digital asset features extend to Desktop

- Upload of large number of assets quickly
- Ingest nested and complex folder structure
- Open and edit assets using local applications
- Find & reveal assets
- View thumbnail / preview, metadata
- Check-in and Check out
- InDesign linked documents

Adobe product engineering teams continue researching to anticipate new trends

- Project Europa: Direct Creative Cloud app integration for AEM.
- Configuration Blueprint: optimized configuration for Assets deployments.
- Solution Architecture: Recommended architecture for specific use cases.
- Operational Excellence: Metrics, monitoring, intelligence, insights.
- Next Generation Technology: 100 Gigabit Ethernet, faster disk IO, Intel 3D Xpoint, cloud scale technologies.

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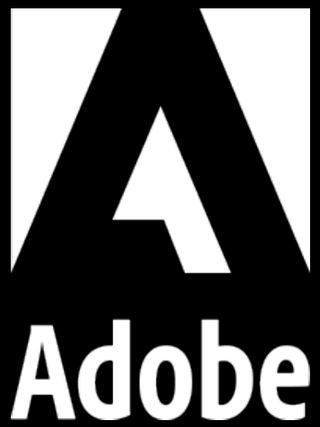
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