

# Achieving Operational Excellence in the Cloud

Nov 17, 2021





# Housekeeping

- Sound check
- Handout
- Ask questions!
- Archive
- Survey

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# Presenter Introductions



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revenue cycle cloud solutions

# Webinar Series

- Session #1: Advantages of Moving to the Cloud (Aug 25, 2021) – Recording available
- Session #2: Security In a Multi-Cloud World (Oct 6, 2021) – Recording available
- **Session #3: Achieving Operational Excellence in the Cloud (Nov 17, 2021)**

# Agenda

- Well Architected Framework
- What is Operational Excellence
- Keys to Operational Excellence

# Poll Question

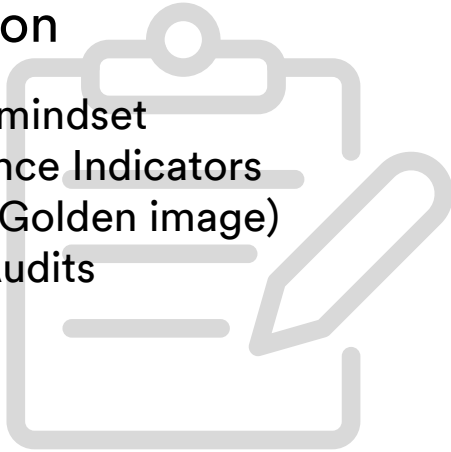
Which of the following do you feel are most important for operational excellence?

- Standardization
- Automation
- Process
- Continuous Process Improvement
- Other

# Accuracy...Consistency...Efficiency

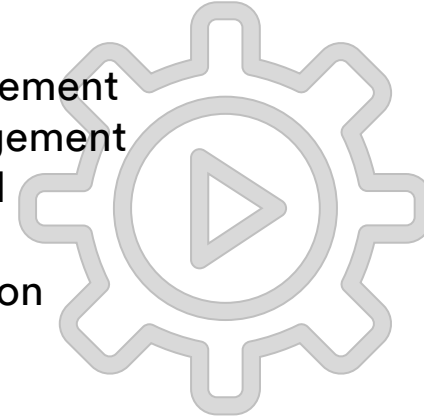
## Standardization

- Service Level mindset
- Key Performance Indicators
- AMI Pipeline (Golden image)
- Comparison Audits



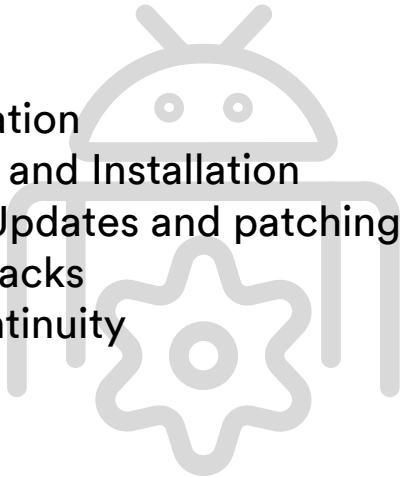
## Process

- Incident management
- Problem Management
- Change Control
- Monitoring
- Update Validation
- Run Books



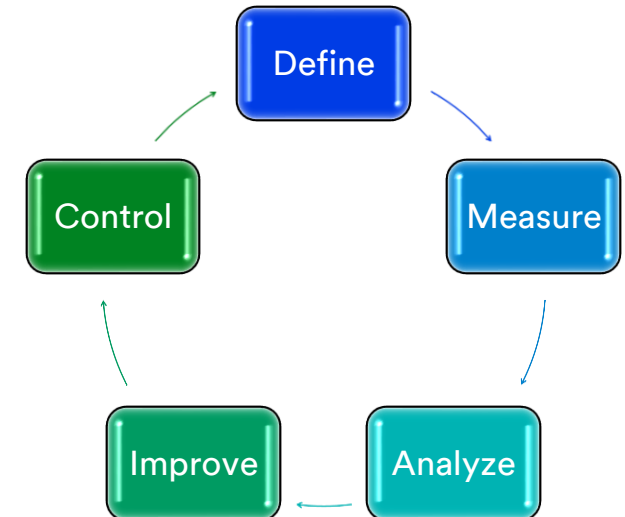
## Automation

- Account creation
- System Build and Installation
- Application Updates and patching
- Update Rollbacks
- Business Continuity

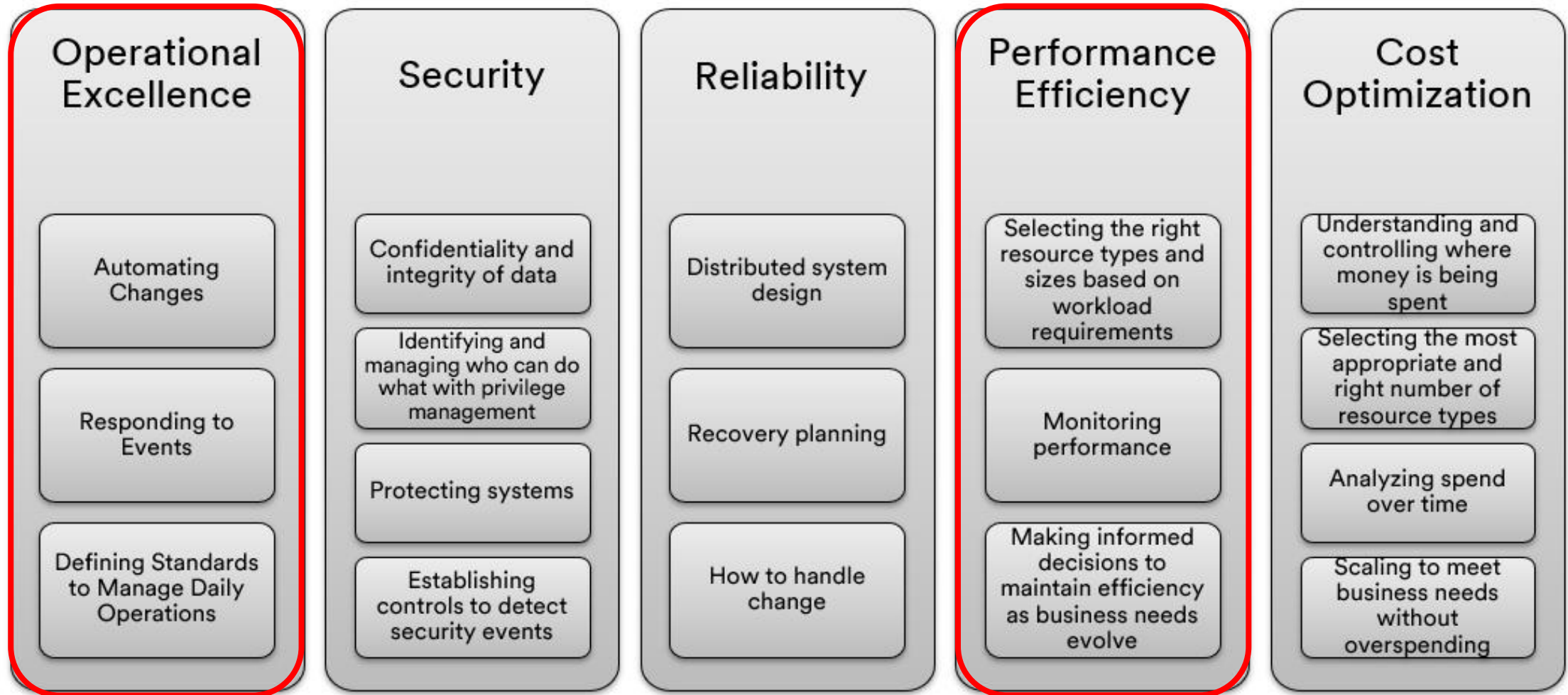


## Continuous Improvement

- Six Sigma approach
- Data Driven
- Incident Postmortems
- Root Cause Analysis

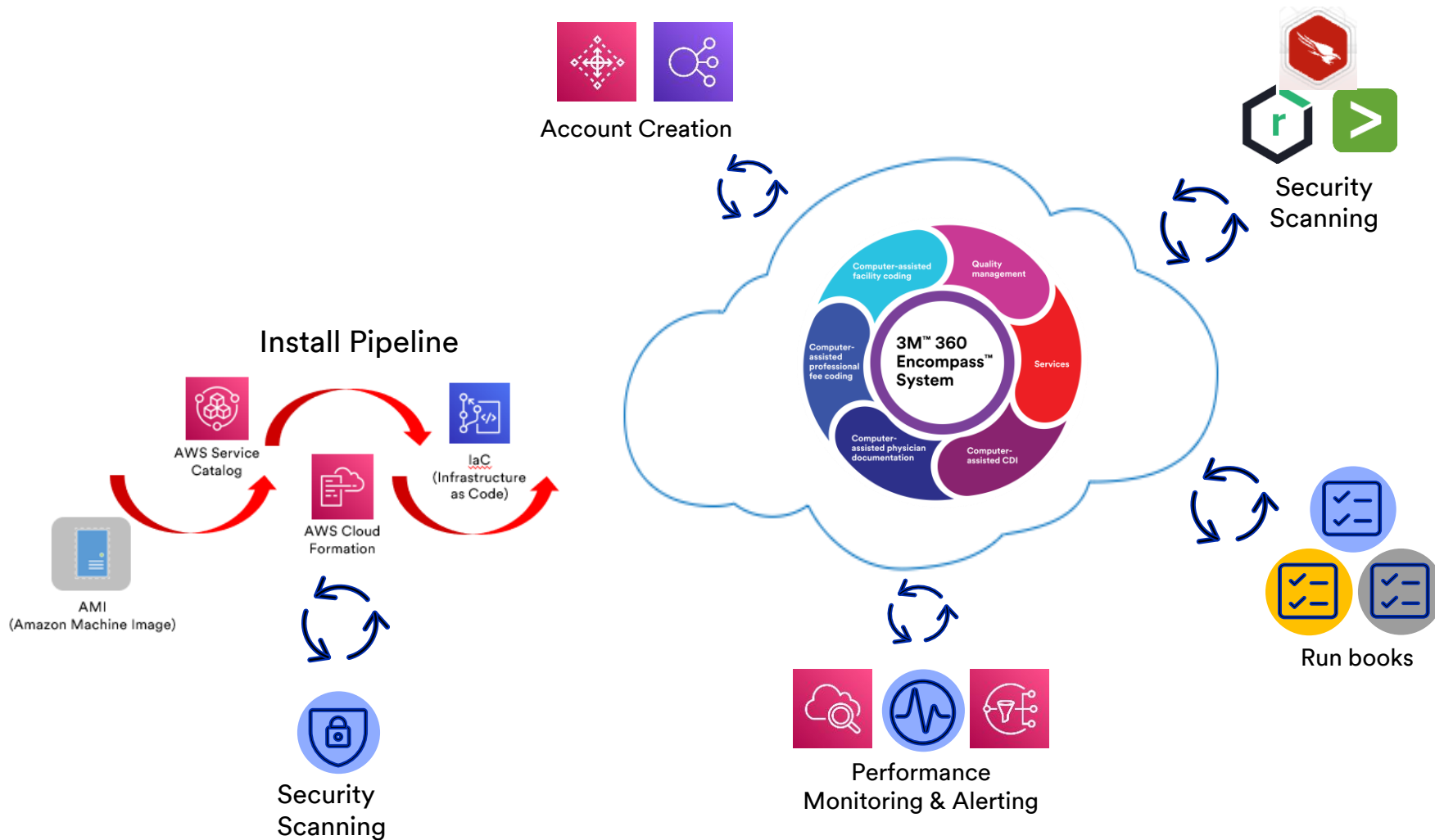


# AWS Well Architected Framework





# Automation



# Incident and Problem Management



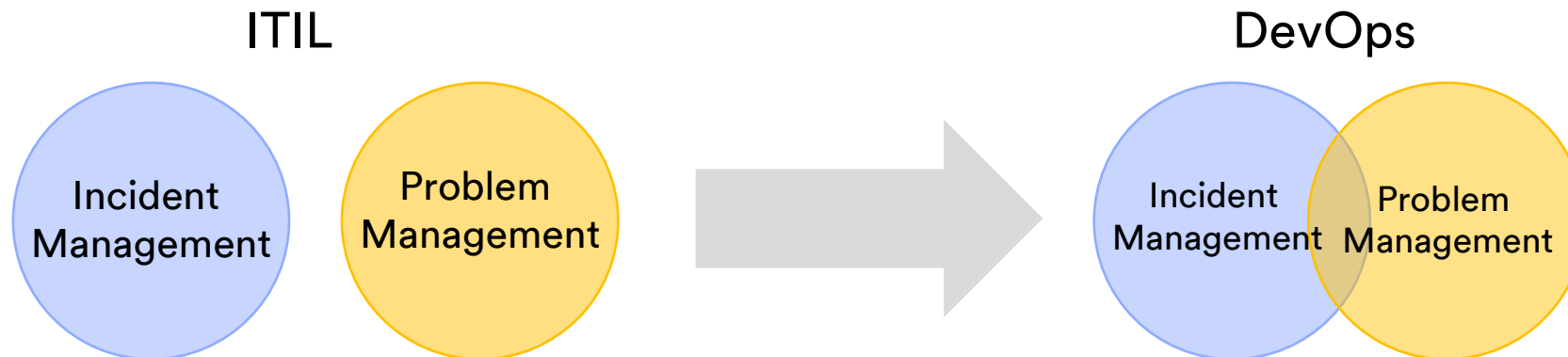
Incident  
management

**Definition:** An incident is a single unplanned event that causes a service disruption.  
**Goal:** resolve the disruption as soon as possible in order to restore service operations.

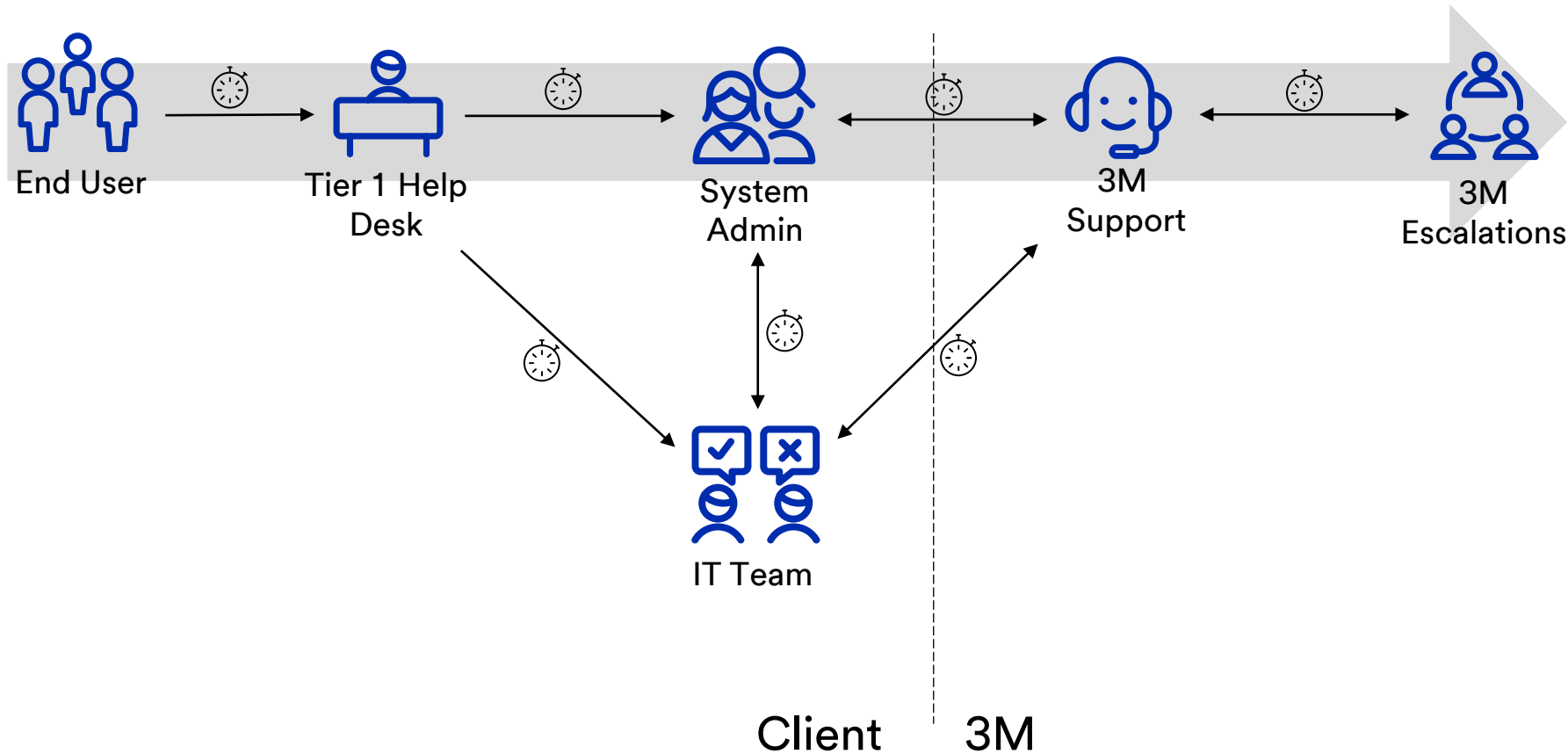


Problem  
Management

**Definition:** A problem is a cause or potential cause of one or more incidents.  
**Goal:** identify the root cause of the incidents and try to prevent them from happening again.



# Incident resolution Process – On-Premises



Antiquated process

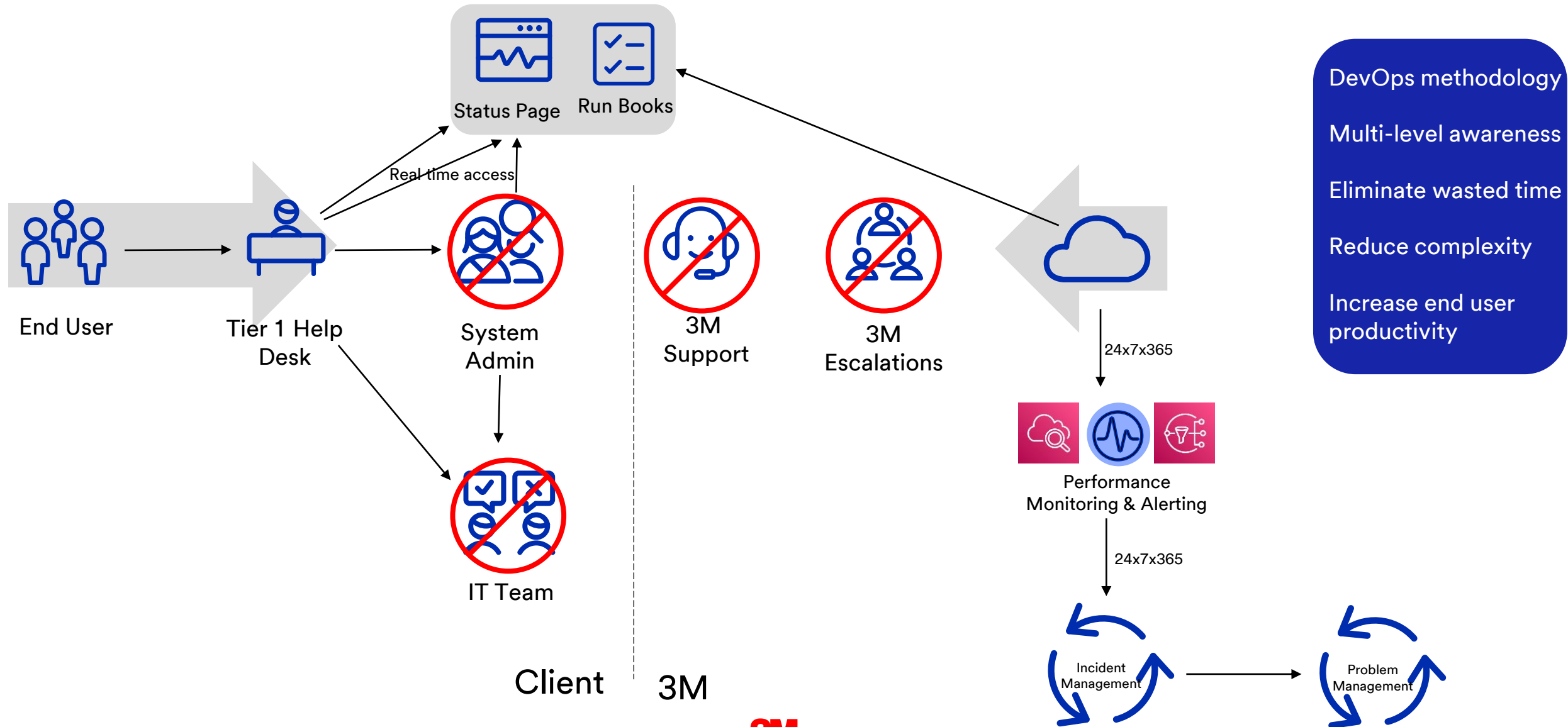
Linear escalations

Wasted time

High complexity

Reduced end user productivity

# Incident Resolution Process – 360 Encompass in the cloud





# Poll Question

Which support model is most widely used within your organization?

- ITIL / Tiered support model
- DevOps
- Swarm
- Other
- Don't Know

# Standards

## Service Levels:

- System Availability
- Recover Point Objective
- Recover Time Objective

## Proactive Monitoring:

- System Performance
- Application response
- Application Performance

## Change Control

## Database Performance

## Performance Testing

## Incident and Problem Management

# Standards

## Monitoring

### Application

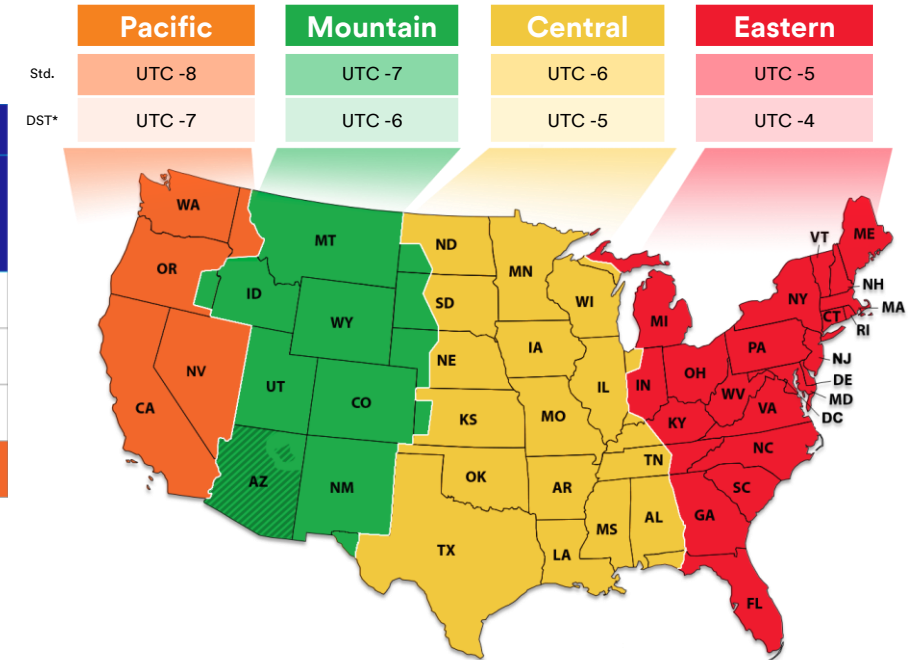
- Canaries
- Smoke tests
- HIS Cloud Monitor
- Log monitoring

### Host-Level





- CloudWatch (CPU/memory/IOPS)
- Host availability

## Maintenance

Patch group	Local Time			
	Eastern	Central	Mountain	Pacific
Eastern	6:00p	7:00p	8:00p	9:00p
Central	5:00p	6:00p	7:00p	8:00p
Mountain	4:00p	5:00p	6:00p	7:00p
Pacific	3:00p	4:00p	5:00p	6:00p



## Change Control

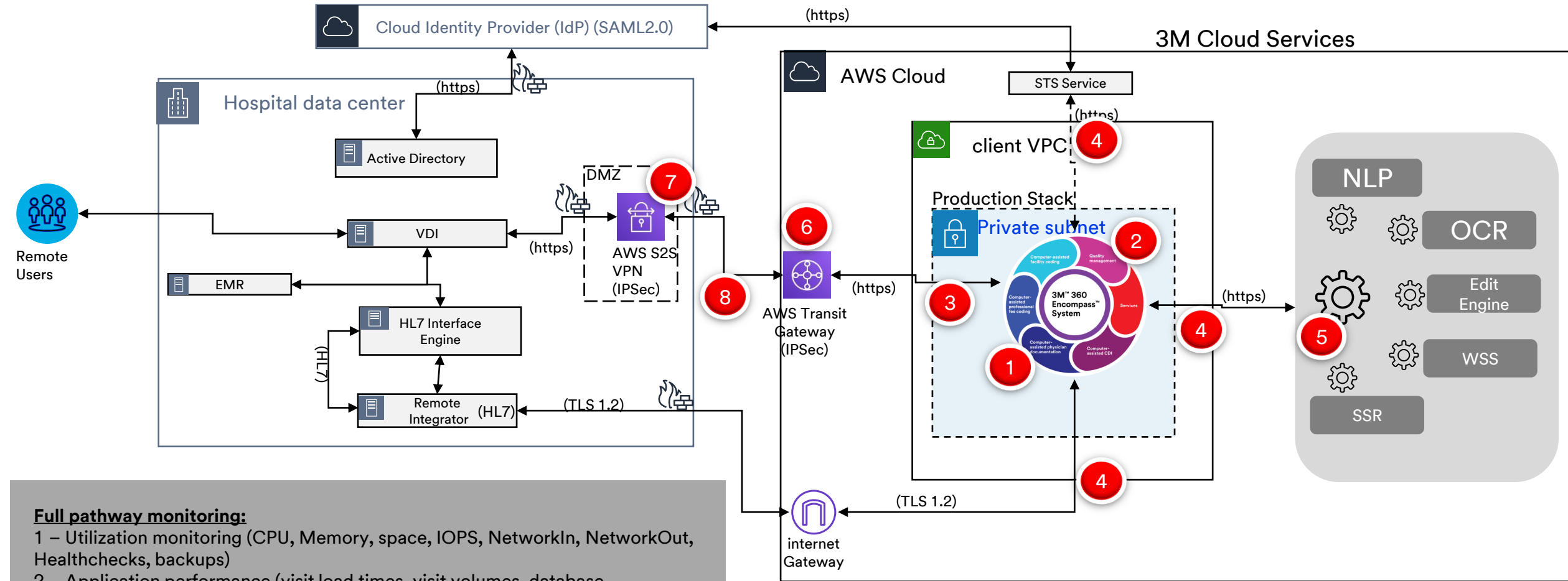
Document and plan	Implement in test	Schedule	Implement in prod
 <p>Create a change request in a long-term retention system, e.g. CX or similar (i.e. not email).</p> <p>Document validation steps.</p> <p>Record approval from the customer on the request.</p>	 <p>Implement the change in a non-production environment.</p> <p>Do this for every change to ensure that systems stay synchronized.</p>	 <p>Schedule a date/time to implement the change in production.</p> <p>Allow adequate time for the change to be validated in non-production environments.</p>	 <p>Implement the change in production during a scheduled maintenance window or during the agreed-upon time.</p>

## Run Books

Run Books: documented steps to increase speed and consistency of repeatable processes and troubleshooting

- 360 Encompass not launching
- Meditech compiling outgoing packet
- Automated alert response
- Ongoing outage management
- Change Control
- WinAppLink Installation error
- Preparing system for upgrade
- Patch group naming
- 360E Code update validation
- 360E Auto-Suggested Codes Troubleshooting
- Slowness
- Outage event review
- Packet filing XML error
- Transition to Support

# 360 Encompass in the cloud – Monitoring



## Full pathway monitoring:

- 1 – Utilization monitoring (CPU, Memory, space, IOPS, NetworkIn, NetworkOut, Healthchecks, backups)
- 2 – Application performance (visit load times, visit volumes, database performance)
- 3 – ALB/NLB healthchecks
- 4 – Egress pathways
- 5 – Community Cloud Services (queues, volume changes, elasticity, network)
- 6 – Transit Gateway throughput
- 7 – Meraki status, throughput, versioning
- 8 – Availability, utilization, throughput



# Performance Efficiency and Reliability

Test	Effect
Baseline	April 1, 2021
w/ VPN	+ 30 – 40 ms
w/extra security	Negligible (< 3 ms)
MS SQL vs RDS	Slight improvement
GP2 vs GP3 storage	Improved performance (0.02S)
Right-sizing	Varies with load
3M App Updates	Varies with release

## Visit Open Times (sec): over 14 days

Managed  
Services

On-Premises Comparisons

Workflow	Client 1*	Comp 1	Comp2	Comp3	Comp4
Overall	4.34	3.87	4.5	4.02	7.19
Inpatient	6.60*	5.56	5.22	5.98	4.42
Outpatient	4.00*	2.23	2.94	2.55	2.31
CDI	7.35	14.129	13.49	15.91	13.30

\*Client 1 is using webservice call, and forms authentication which are adding overhead.

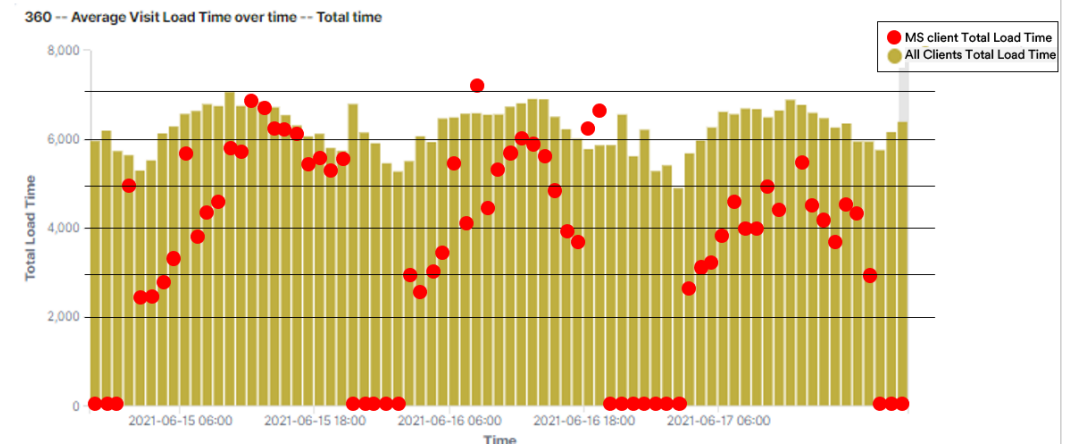
Client 1 = 1,700 visits/day | Comp1 = 12,000 visits/day | Comp2 = 700 visits/day | Comp3 = 1,500 visits/day  
Comp4 = 1,200 visits/day

## Performance Data – Client Production Systems

	Managed Services Clients
System availability	99.97 % - 100%
DR events	0
# Sev 1 /Sev 2 issues	4

Most common issues: Proxy Server/Firewall changes or power outage in client Data Center

## Performance Data – Global Comparison



# Partnering for Operational Excellence

Common goal: provide optimal user experience to achieve your business goals

## On-Premises Challenges:

- 24 x 7 x 365 Product expertise
- Up to 10 different IT roles needed to implement and support 360 Encompass
- Lack of visibility into system/application performance
- Retroactive support models
- Test vs Prod change control
- Competing priorities
- Shifting focus away from service delivery toward strategic initiatives and business outcomes

## Cloud Solutions:

- Provide 24 x 7 x 365 Incident response with 3M experts
- Client-side issues narrowed to primarily proxy, firewall, Citrix/VDI
- 24 x7 x 365 system/application monitoring
- Proactive support model
- Strict change control w/ auditing tools
- Common experience across all clients
- Designed for issue prevention
- Agile deployment processes

# Poll Question

What are your biggest challenges when working with multiple cloud vendors?

- Managing Connectivity
- Managing Security
- Incident Management
- Transparency of vendor/solution performance
- Coordinating application upgrades across vendors
- Other

# Microsoft Life Cycle

## Microsoft End of Life

SQL Server 2012 = July 12, 2022

Server 2012 r2 = Oct 10, 2023 (was previously Jan 2023)

Note: 3M follows Microsoft Lifecycle and cannot support 3M solutions on Microsoft versions beyond End of Life.



# Considerations in moving to 360E in the cloud

## **Security:**

1. Can you encrypt your HL7 data on-premises?
2. Does your document management system have an HL7 document interface?
3. Are you using reference pointers for document retrieval?
4. Do you have good change control processes for Proxy Servers/Firewalls?
5. Is all the application data encrypted?
6. Can you support single sign-on with an Identity Provider or support ADFS authentication?

## **Location of your EMR, interface engine and user remote desktops:**

1. Is your EMR on-premises, hosted by your EMR vendor, or hosted by a third party?
2. Is your interface engine on-premises, hosted by your Interface vendor, or hosted by a third party?
3. Are your user remote desktops located on-premises, or hosted by a third party?
4. Does your EMR offer a web version?

## **Vendor connection requirements:**

1. Can you deploy vendor-owned VPN appliances in your DMZ?
2. Do you have enough bandwidth available on your existing circuits?

## **User Experience:**

1. What is your user experience with Citrix/VDI today? Will this impact the user experience with cloud hosted solutions?
2. What needs to be installed on the user's remote desktop?
3. Does the solution enhance or add to your operational excellence?

# Questions

**I would like a member of the team to contact me to learn more.**

- Yes, please contact me.
- No, not at this time.

**Thank you.**