

Experiences Implementing DevOps

November 8, 2017



Meeting Format

- ▶ Introductory Comments
- ▶ Panelist Introductions
- ▶ Panelist Presentations
- ▶ Moderated Q&A
- ▶ Open Q&A

What is DevOps?

- ▶ DevOps is a term introduced by Andrew Shafer and Patrick Debois in their talk on "Agile Infrastructure" at the 2008 [Agile](#) Toronto conference
- ▶ “**DevOps** is a software engineering practice that aims at unifying software development (Dev) and software operation (Ops). The main characteristic of the DevOps movement is to strongly advocate [automation](#) and [monitoring](#) at all steps of [software construction](#), from [integration](#), [testing](#), [releasing](#) to deployment and [infrastructure management](#). DevOps aims at shorter development cycles, [increased deployment frequency](#), more dependable releases, in close alignment with business objectives.” [Wikipedia]
- ▶ “One could view DevOps as a generalization of several core SRE principals to a wider range of organization management structures, and personnel. One could equivalently view SRE as a specific implementation of DevOps with some idiosyncratic extensions.” [Google -- *Site Reliability Engineering*]

Who is doing DevOps?

- ▶ How many of you currently have a DevOps practice?
- ▶ How many of you tried to establish a DevOps practice and failed or shut down that practice?
- ▶ How many of you are interested in establishing a DevOps practice?

Sanjay Maru
Director, Enterprise Architecture
St. Joseph Health



Steve Mason
Program Director
IBM Corporation



Marc Tamsky
VP, Systems Reliability Engineering
Veritone, Inc.



Site Reliability Engineering & DevOps

Planning for change

Marc Tamsky

November 8, 2017



Traditional **Ops** involves blanket acceptance of change:

- Product plans new features
- Developers add them

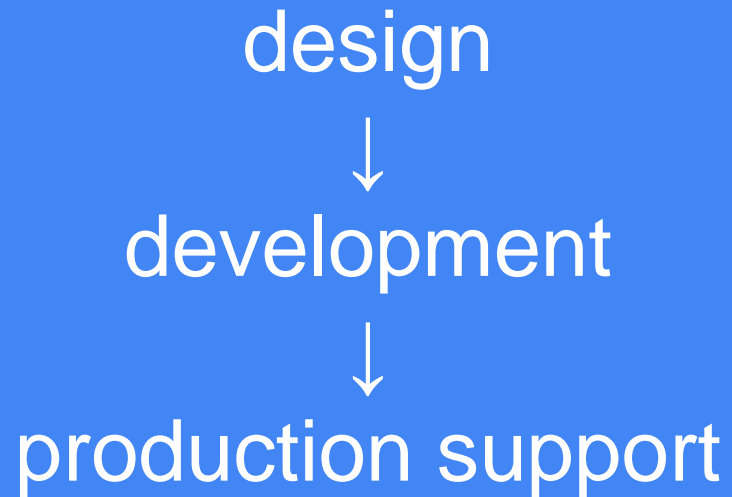


ACCEPT
NEW
FEATURES
AND
CARRY ON

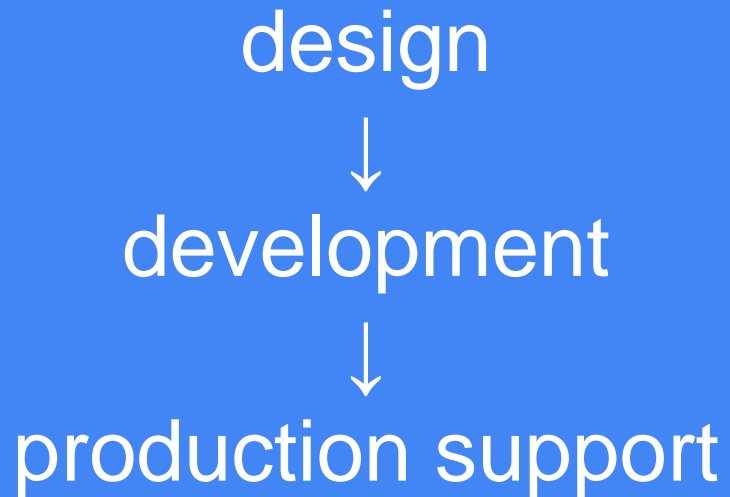
Is DevOps a

- Concept
- Process
- Practice
- Culture
- Tools
- ?

DevOps is the practice of operations and development engineers participating together in the entire service lifecycle:



DevOps is the practice of operations and development engineers participating together in the entire service lifecycle:



In general, an SRE team is responsible for the

- **Availability**
- **Latency**
- **Performance**
- **Efficiency**
- **Change management**
- **Monitoring**
- **Emergency response**
- **Capacity planning**

of their service(s).

SRE Rules

Hope is not a plan.

New services desiring SRE coverage always exceeds available SRE budget.

SRE Team Engagement Points

During Design

The earlier an SRE team consultation happens, the sooner the benefit.

By engaging SRE during the earliest stages of **design** — one can verify that production-ready services are being included.

Even earlier

Provide product development with a **platform** of SRE-validated infrastructure upon which they can build their systems.

By promulgating infrastructure best-practices SRE allows product development teams to focus on innovation at the application layer.

In your organization,
who is empowered to critically
evaluate and reject harmful
changes to production?

DevOps Journey

OC ACM

Sanjay Maru - 11.8.2017

St. Joseph Health at a glance



16
HOSPITALS



300+
CLINICS

10 COMMUNITIES SERVED ACROSS



15K
CAREGIVERS



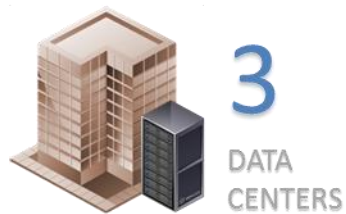
41K
LICENSED BEDS



441M
COMMUNITY BENEFIT

St. Joseph Health

St. Joseph Health IT at a glance



IT Strategy & Architecture Roadmap

1. Technology Efficiency

- Simpler Solutions
- Standardized Platforms
- Agile and Scalable Design

2. Architect for the Future

- Private, Public, Hybrid Strategy
- Architect for the Business Need
- Embrace Future Technologies

3. Workforce Productivity

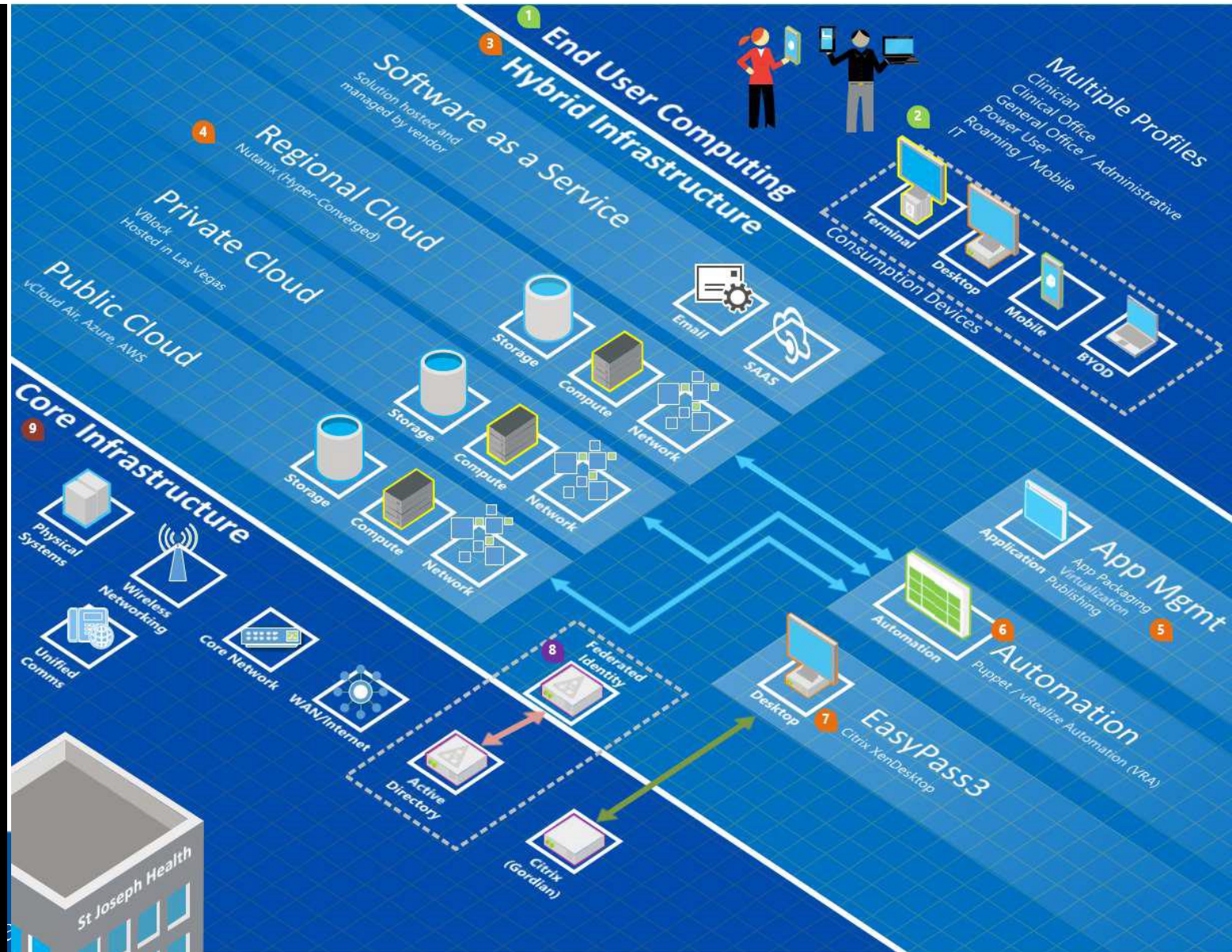
- Blended/Shared Support
- Optimize Pipeline Management
- Invest in New Skills

4. Business IT Service

- IT is a Service Provider
- Deliver Services
- Manage Programs

5. Visibility & Transparency

- Develop IT Cost Model
- Measure Success
- Visibility Into Everything

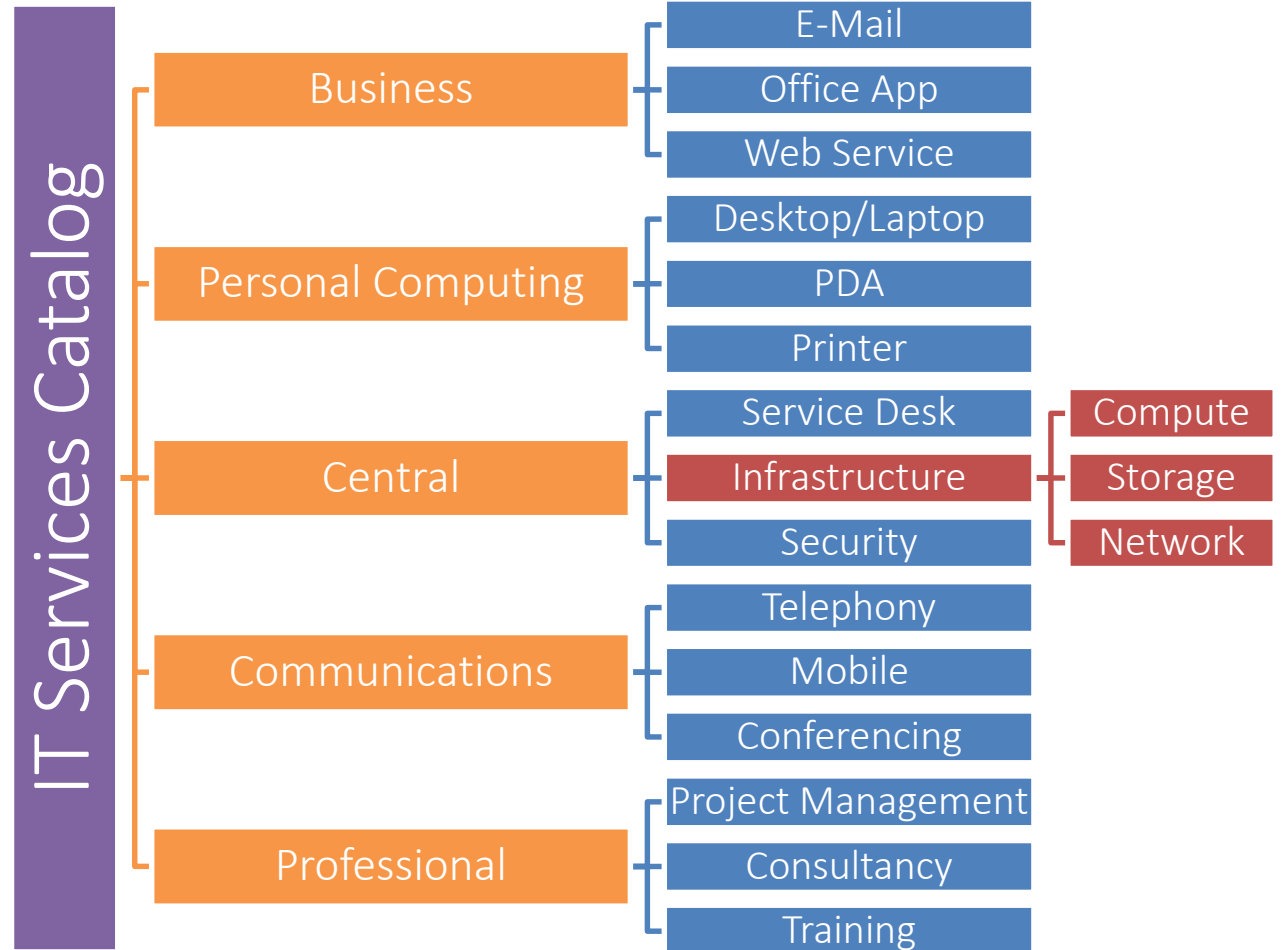


St Joseph Health

DevOps with ITIL

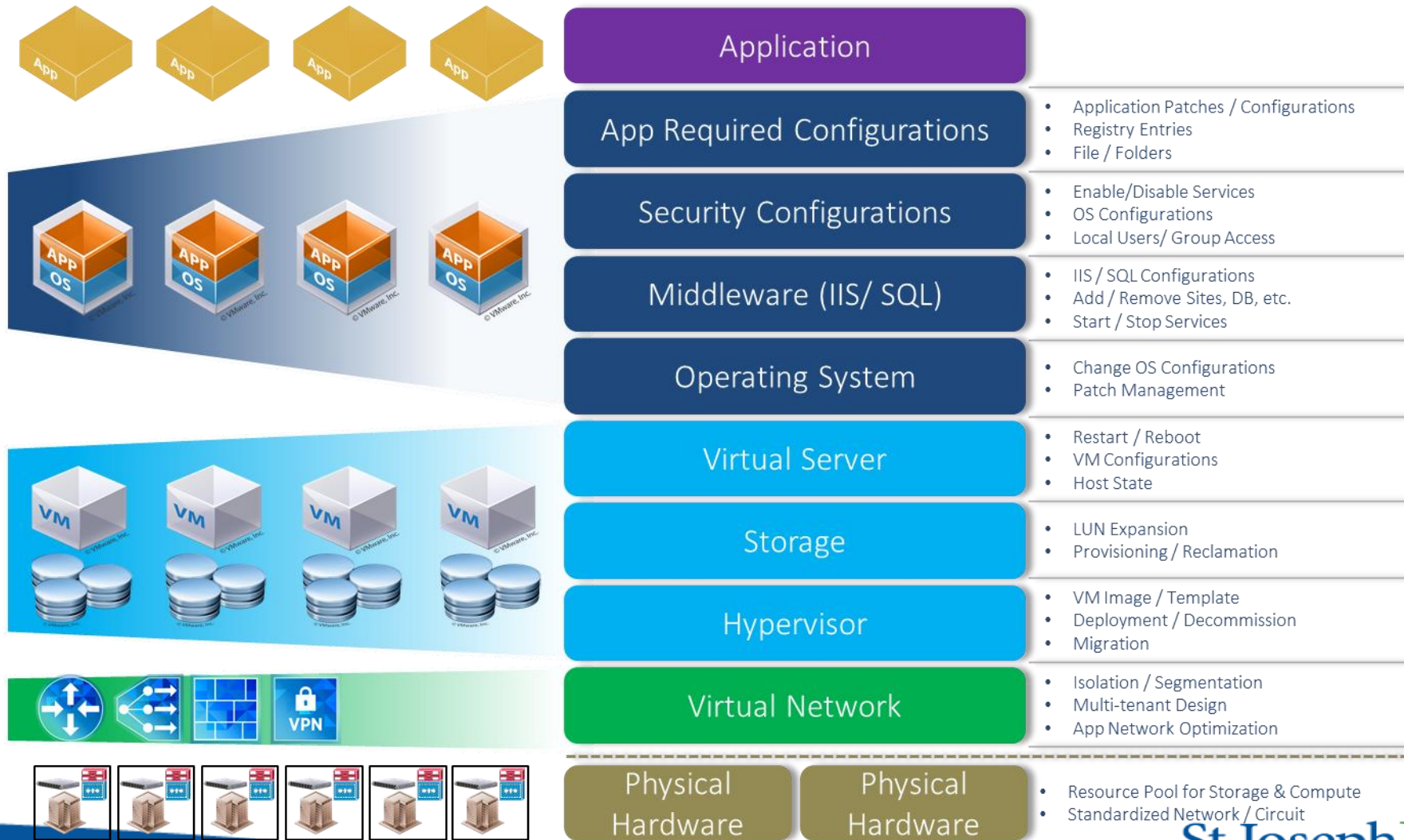


How



What

St. Joseph Health Infrastructure Landscape



DevOps Objectives

Menu-Based Provisioning

- 1 to 1000's of servers in minutes

Security

- Industry leading security
- Automated audit/compliance
- Continuous configuration management

Dev/Test/Prod Environments

- Eliminate accidental outages
- Protected environments
- Test before deploy

Business Continuity & DR

- Recover in minutes
- Continuous recovery testing

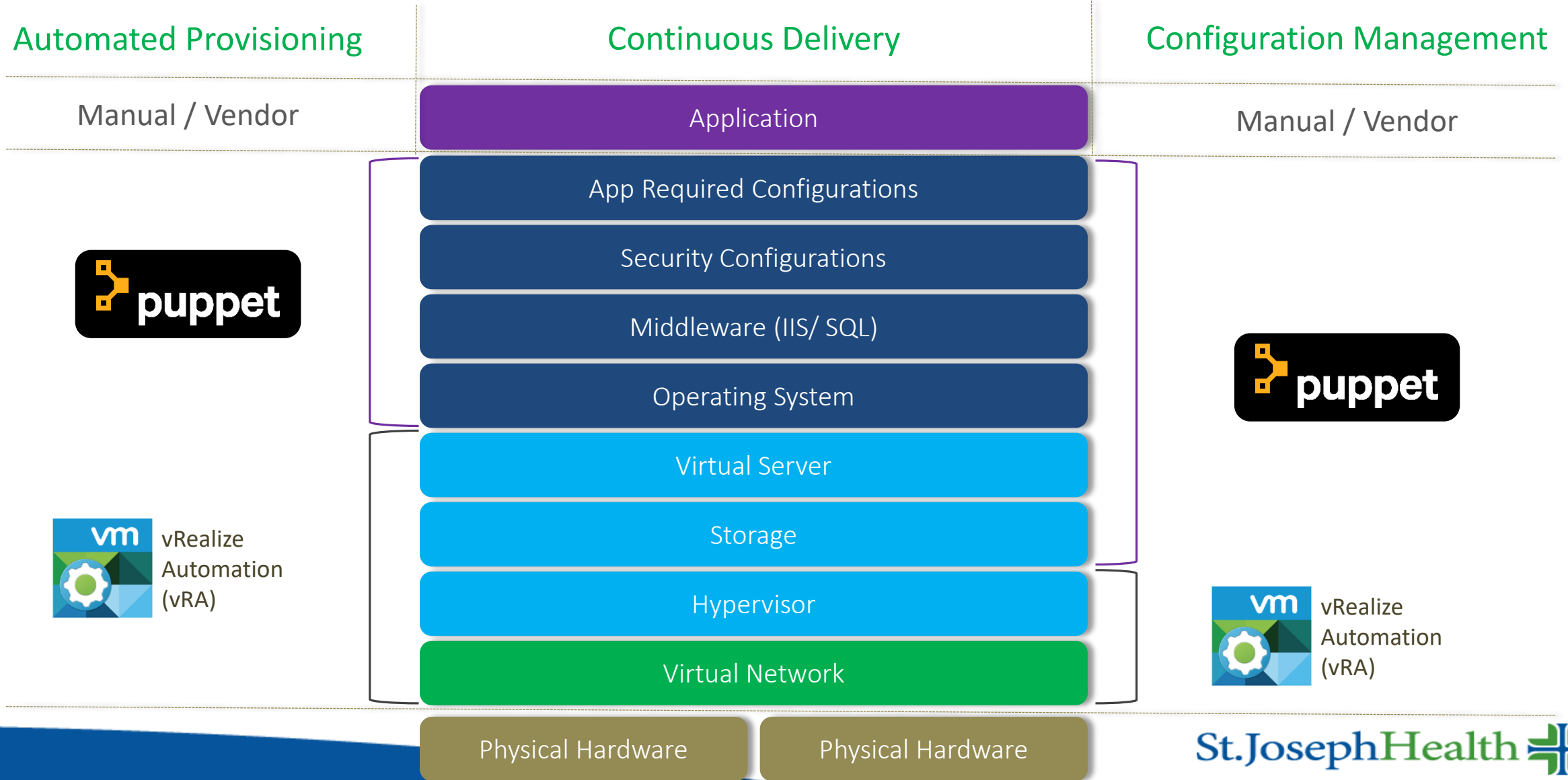
Zero Touch

- Administration
- Support

Service Level Agreements (SLA's)

- Performance
- Availability
- Support

Auto Provisioning, Continuous Delivery & Configuration Management



DevOps Transition Lessons & Considerations



People

- Resources
- Skills
- Training



Process

- Transition
- Client Impact



Technology

- Identification
- Evaluation
- Selection



ACM Experiences Implementing DevOps IBM ECM DevOps Journey

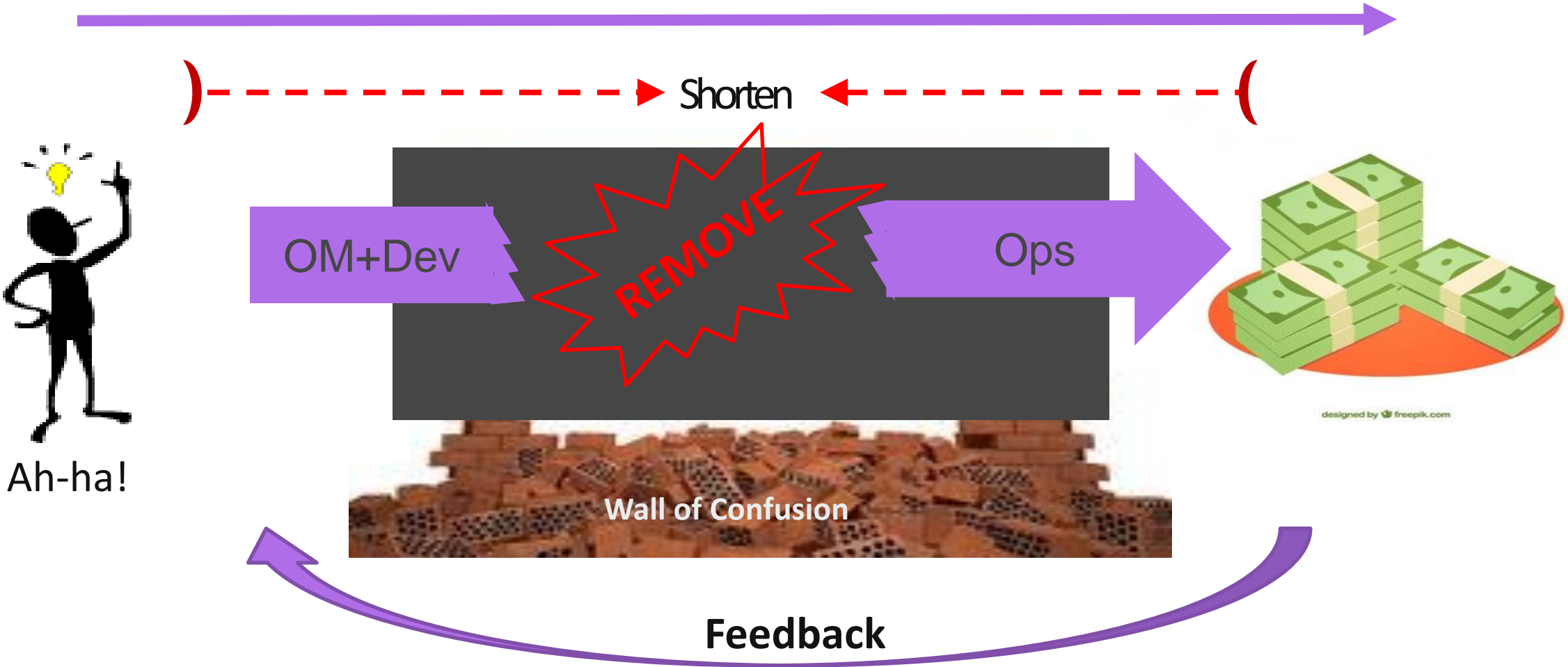
Stephen Mason
November 8, 2017

World of
Watson
2016



Requires the DevOps Culture

Lead Time



Measurement is Key - *accountability spans operations and development*

Service Level Agreements



Provisioning, Availability



Cost of Running the Service

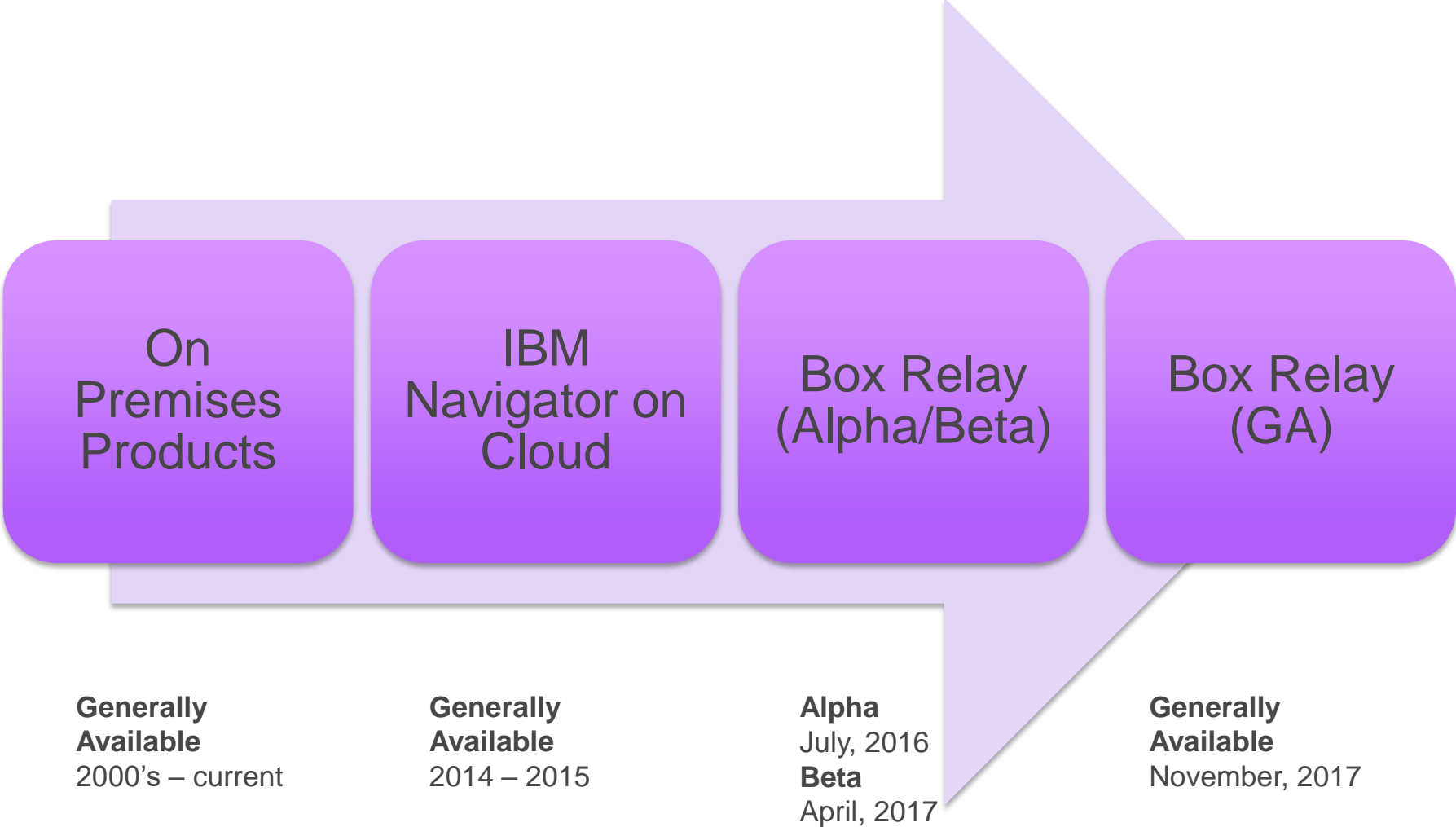


Renewals, Revenue,
Reference



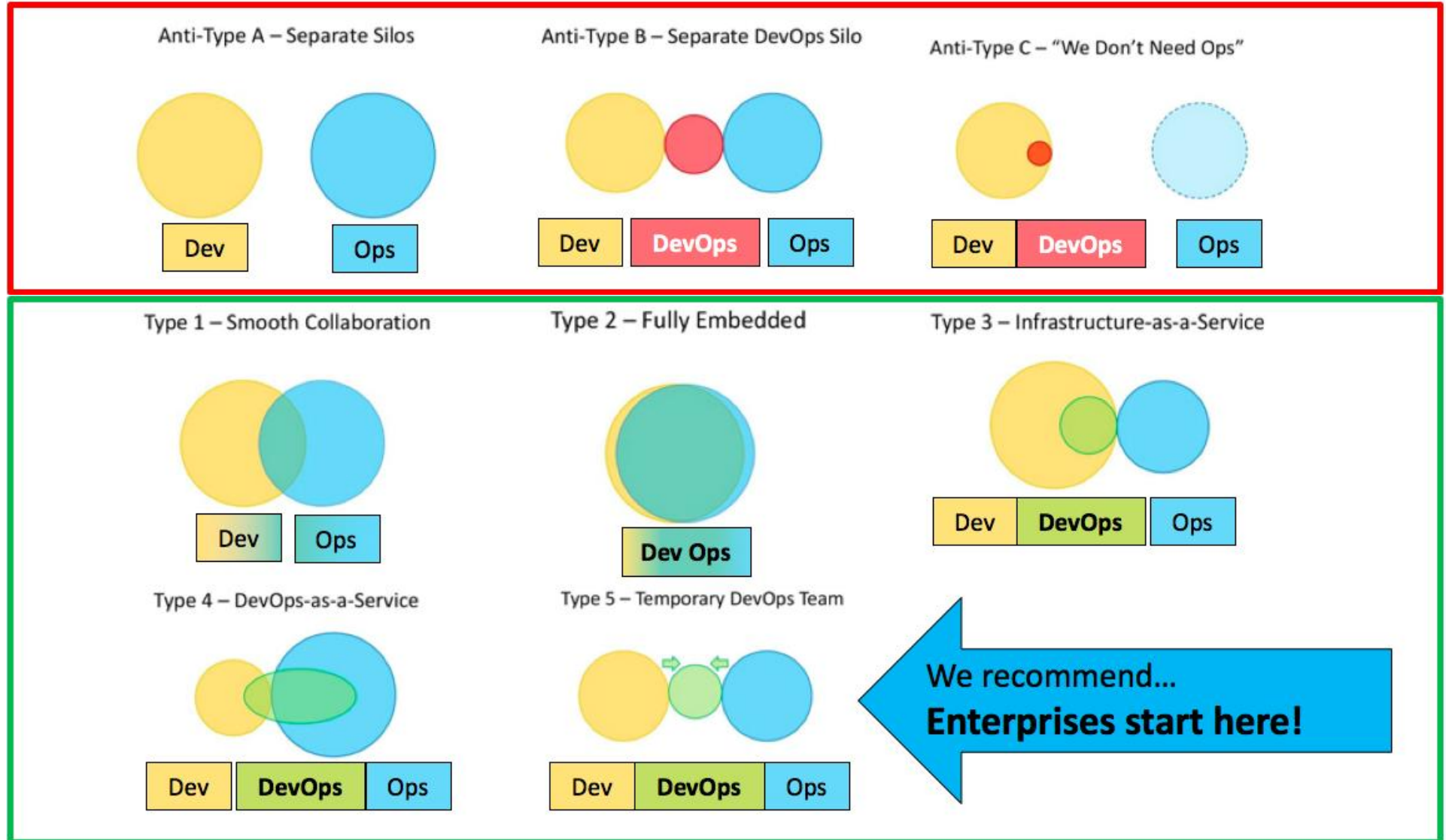
Compliance Achievements

IBM Enterprise Content Management Journey...



Matthew Skelton's DevOps Team Topologies

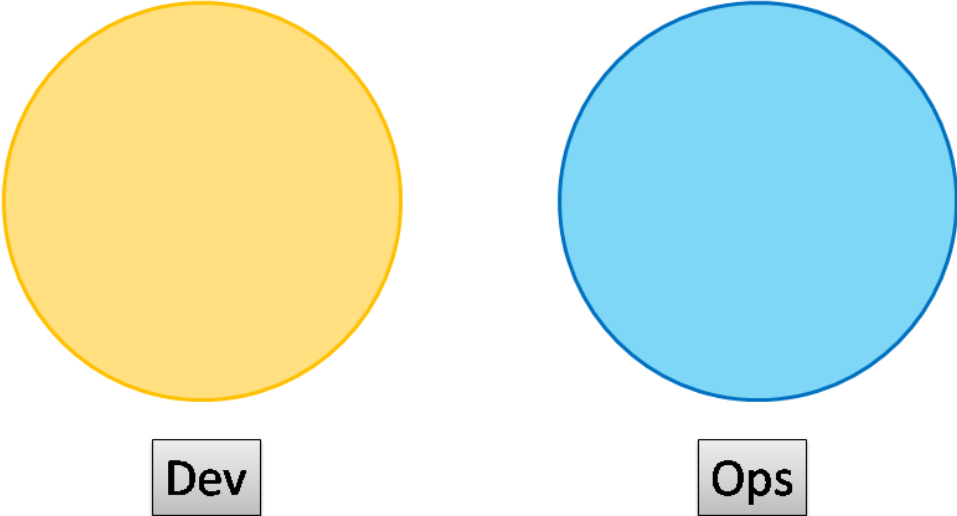
Form a team of skilled/trusted experts – and SCALE!



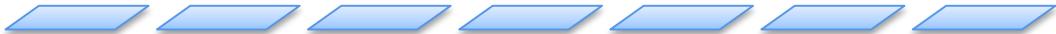
IBM Navigator on Cloud



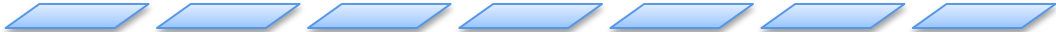
Anti-Type A – Separate Silos



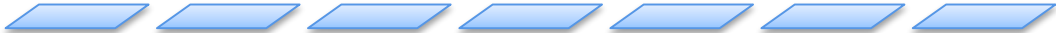
Waterfall from Dev to Ops



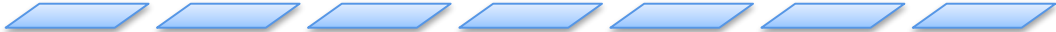
Significant technical debt (automation, runbooks)



Operations was an afterthought



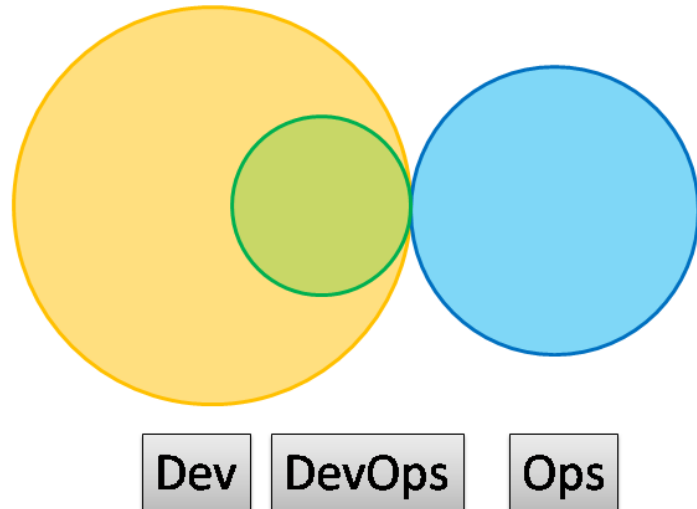
Difficult and expensive to operate



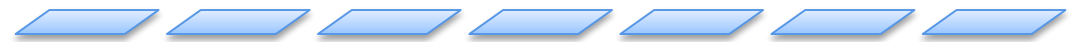
Box Relay (Alpha and Beta)



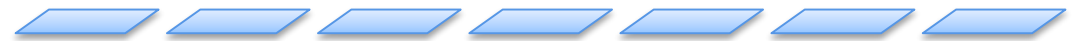
Type 3 – Infrastructure-as-a-Service



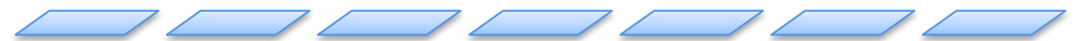
Reduced Waterfall from Dev to Ops



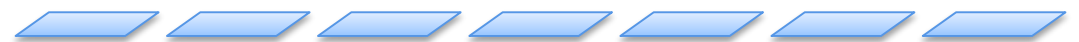
Reduced Technical debt



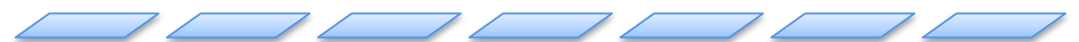
Operations shifting left into development



Operation less difficult but still expensive



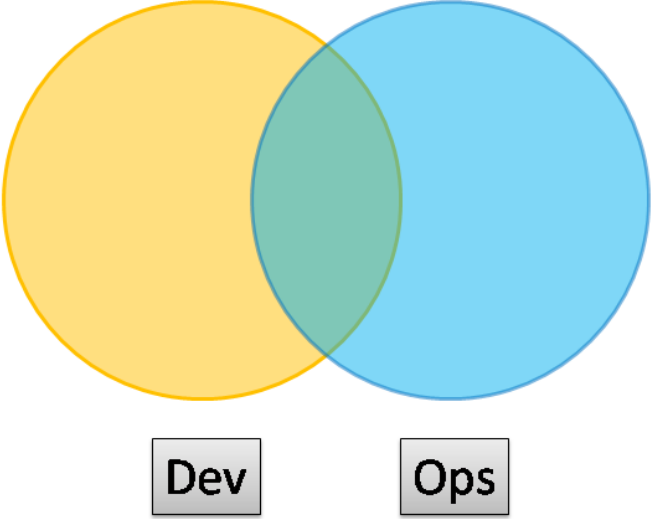
Box and IBM cultural alignment



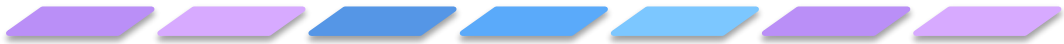
Box Relay (General Availability)



Type 1 – Smooth Collaboration



Eliminate Waterfall from Dev to Ops



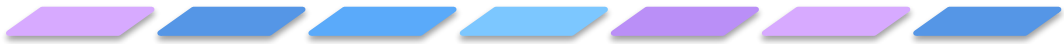
Eliminate Technical debt



Dev and Ops have shared goals



Adopted SRE model between Dev and Ops



Cultural change largely complete



The Continuous Delivery Maturity Model

	Base	Beginner	Intermediate	Advanced	Expert
Culture & Organization	<ul style="list-style-type: none"> • Prioritized work • Defined and documented process • Frequent commits 	<ul style="list-style-type: none"> • One backlog per team • Share the pain • Stable teams • Adopt basic Agile methods • Remove boundary dev & test 	<ul style="list-style-type: none"> • Extended team collaboration • Component ownership • Act on metrics • Remove boundary dev & ops • Common process for all changes • Decentralize decisions 	<ul style="list-style-type: none"> • Dedicated tools team • Team responsible all the way to prod • Deploy disconnected from Release • Continuous improvement (Kaizen) 	<ul style="list-style-type: none"> • Cross functional teams • No rollbacks (always roll forward)
Design & Architecture	<ul style="list-style-type: none"> • Consolidated platform & technology 	<ul style="list-style-type: none"> • Organize system into modules • API management • Library management • Version control DB changes 	<ul style="list-style-type: none"> • No (or minimal) branching • Branch by abstraction • Configuration as code • Feature hiding • Making components out of modules 	<ul style="list-style-type: none"> • Full component based architecture • Push business metrics 	<ul style="list-style-type: none"> • Infrastructure as code
Build & Deploy	<ul style="list-style-type: none"> • Versioned code base • Scripted builds • Basic scheduled builds (CI) • Dedicated build server • Documented manual deploy • Some deployment scripts exists 	<ul style="list-style-type: none"> • Polling builds • Builds are stored • Manual tag & versioning • First step towards standardized deploys 	<ul style="list-style-type: none"> • Auto triggered build (commit hooks) • Automated tag & versioning • Build once deploy anywhere • Automated bulk of DB changes • Basic pipeline with deploy to prod • Scripted config changes (e.g. app server) • Standard process for all environments 	<ul style="list-style-type: none"> • Zero downtime deploys • Multiple build machines • Full automatic DB deploys 	<ul style="list-style-type: none"> • Build bakery • Zero touch continuous deployments
Test & Verification	<ul style="list-style-type: none"> • Automatic unit tests • Separate test environment 	<ul style="list-style-type: none"> • Automatic integration tests 	<ul style="list-style-type: none"> • Automatic component tests (isolated) • Some automatic acceptance tests 	<ul style="list-style-type: none"> • Full automatic acceptance tests • Automatic performance tests • Automatic security tests • Risk based manual testing 	<ul style="list-style-type: none"> • Verify expected business value
Information & Reporting	<ul style="list-style-type: none"> • Baseline process metrics • Manual reporting 	<ul style="list-style-type: none"> • Measure the process • Static code analysis • Scheduled quality reports 	<ul style="list-style-type: none"> • Common information model • Traceability built into pipeline • Report history is available 	<ul style="list-style-type: none"> • Graphing as a service • Dynamic test coverage analysis • Report trend analysis 	<ul style="list-style-type: none"> • Dynamic graphing and dashboards • Cross silo analysis

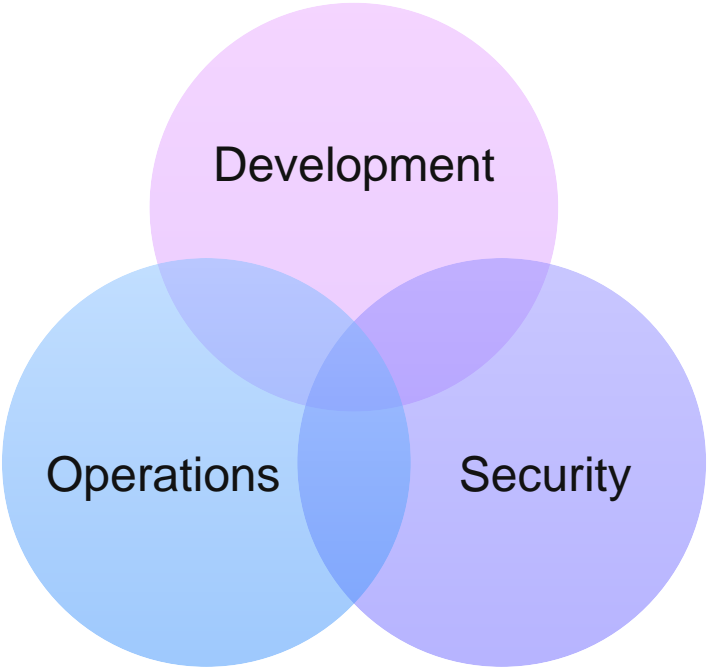


What's Next?

Continuous improvement

Automate, automate, automate

Incorporate Security into existing DevOps -> DevSecOps



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