

Improving Day 2 Management of Critical Infrastructure

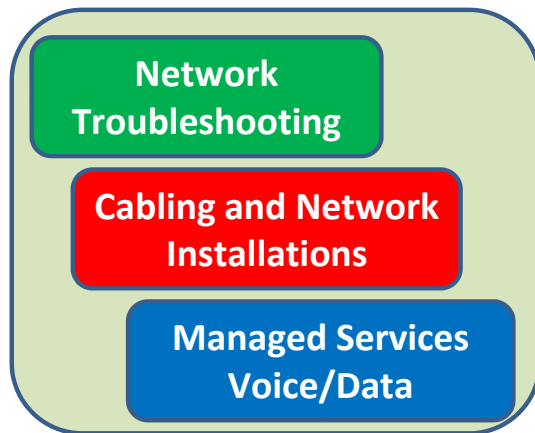
David Cuthbertson

Square Mile Systems / AssetGen



My Background

Personal Experience



Industry Groups and Frameworks



LinkedIn
Group Manager

Data Center Engineering
Data Center Operations Management



Improving Day 2 Management Of Critical Infrastructure

Day 1

We use the best components and installation practices we can afford

Everything works as planned and hand it over – finished!

Contractors leave site and everybody moves on to the next project

Current Projects

- Baseline the physical infrastructure of 85 data halls with 6500 racks for change provisioning and capacity management. Help improve ongoing management processes so documentation is maintained daily.
 - Floor plans, rack layouts, inventory, patching
- Map applications, supporting physical/virtual servers and data flows to enable auditors to verify compliance with credit card security rules (PCI-DSS) as well as environment / change management.
- Identify which physical and logical infrastructure is shared by a banking division which has been sold to a competitor.
- Establish an accurate picture of the current infrastructure (5 DCs and 2000 campus locations) so they can be upgraded/transformed/refreshed across by various suppliers over 3 years. Develop operational data needs / processes.

Critical Infrastructure Is Everywhere...

CRITICAL INFRASTRUCTURE SECTORS



Agriculture and Food



Banking and Finance



Chemical



Commercial Facilities



Communications



Critical Manufacturing



Dams



Defense Industrial Base



Emergency Services



Energy



Government Facilities



Healthcare and Public Health



Information Technology



National Monuments and Icons



Nuclear Reactors, Materials and Waste



Postal and Shipping



Transportation Systems



Water

Source: http://www.dhs.gov/files/programs/gc_1189168948944.shtm



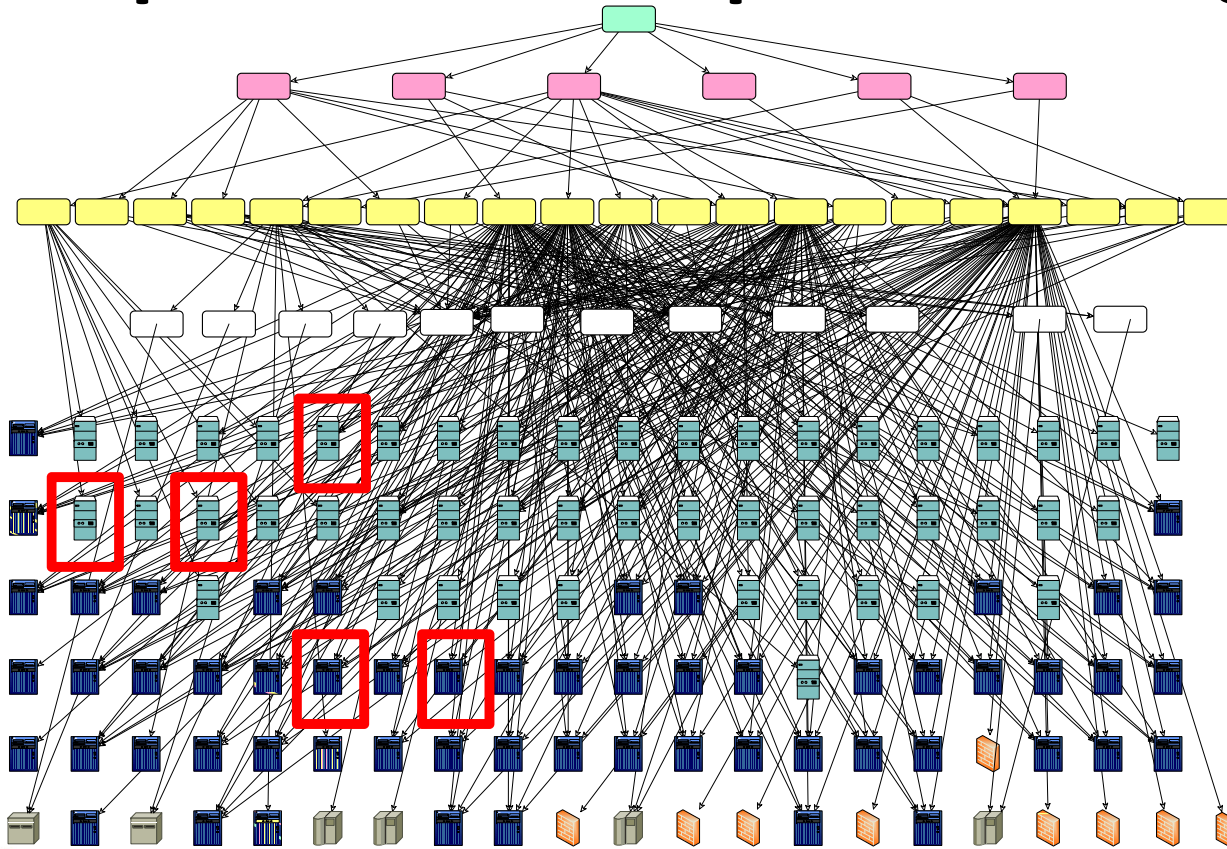
Not the best starting point to identify a connectivity problem with air traffic control!

Bicsi

Why Is Managing Critical Infrastructure Difficult?

- It is often not seen as important as delivering projects, so budget for improving management practices is often minimal.
- It is difficult in practice
 - Many teams and people involved in changes, some cultural issues
 - Adapt change processes that work across multiple teams
 - Lots of spreadsheets, configurations, dependencies to understand
 - Very detailed and prone to error
- Inconsistencies and multiple technologies make it complex
- Very costly to sort out once control and trust is lost
- And when things go wrong – its always a management problem!

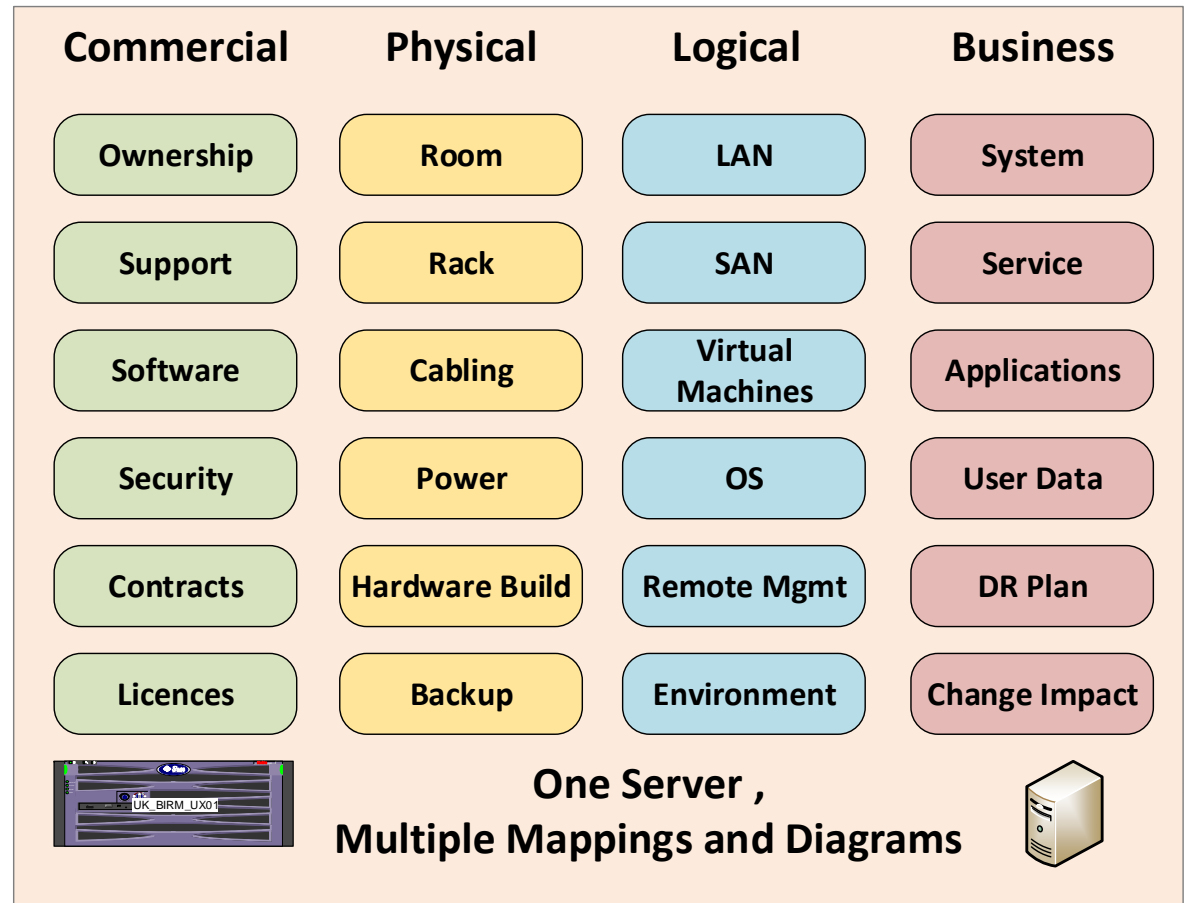
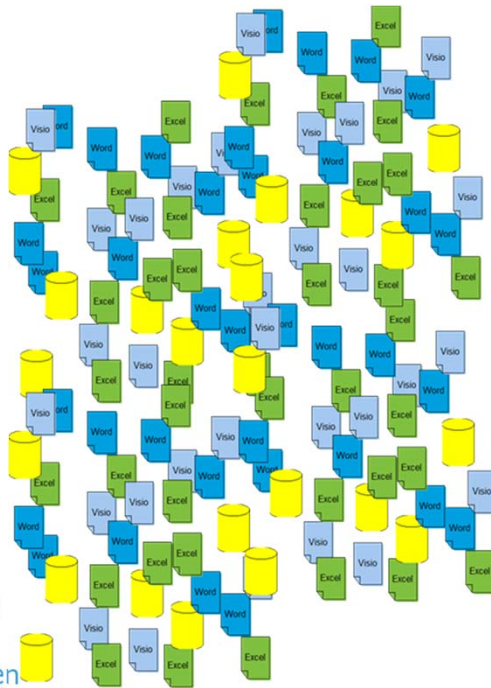
Simple Task – Complex Planning



We need to
move 5
servers to
another row
of cabinets

Shared Infrastructure Isn't Simple

Many 1,000s of documents are created by projects, operations and risk processes

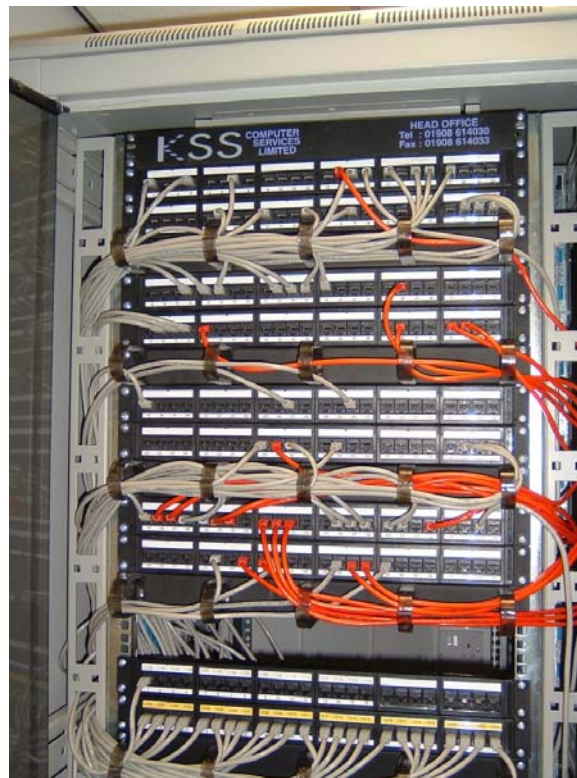


One Technology - Different Methods

A



B



Easy to fault find?

Manage capacity?

Make changes without risk?

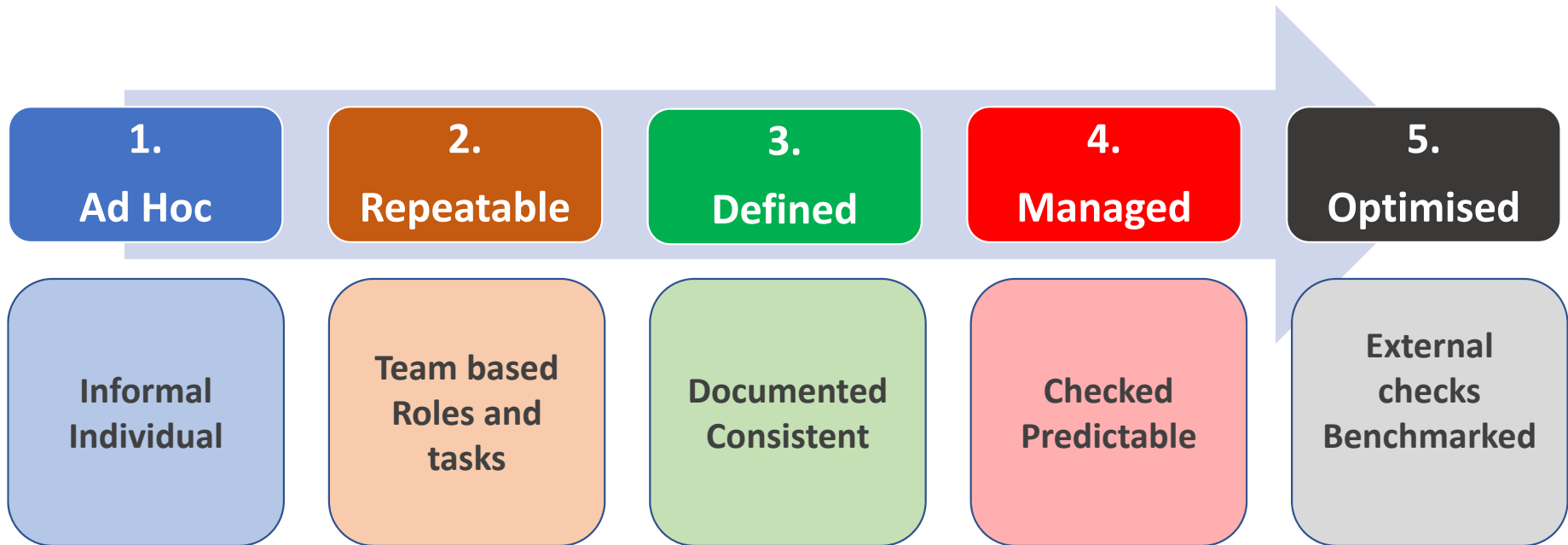
Easiest to plan?

Write work instructions?

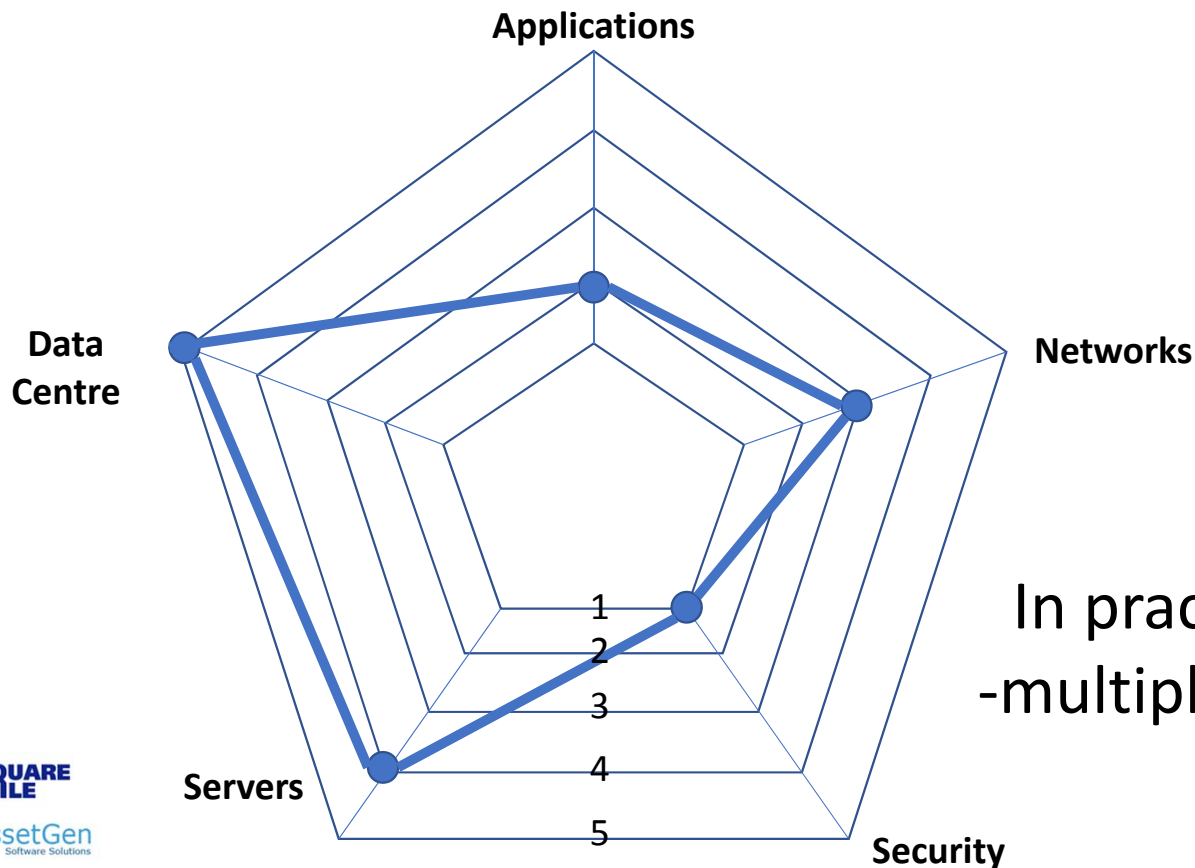
Predict time taken?

Bicsi

Defining Infrastructure Management Maturity



Management Maturity Communication



Which team/function presents the most risk because of lack of management control / methods?

In practice it is more complicated -multiple teams, locations, partners

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The ongoing delivery of information management depends directly on how it is managed operationally

How change is controlled

How incidents are managed

How the “IT team” understands, communicates and mitigates risks

Plus all the usual management jobs...



Some Of The Usual IT Management Jobs...

1. Managing changes and complexity - new and legacy systems
2. Managing production / test / recovery / development environments
3. Identifying root causes of faults and performance
4. Control of access to data and flows to avoid bandwidth / security issues
5. Migration / transition planning
6. Cost management – contract, server and equipment lifecycle
7. Managing changes in staff, vendors and support partners
8. Application development and software dependencies
9. Best use of internal staff / contractors / 3rd parties
10. Licensing management
11. Backups / recovery / continuity planning
12. Proof of management control – ITIL, CoBit, 27001, PCI DSS, NIST, etc.

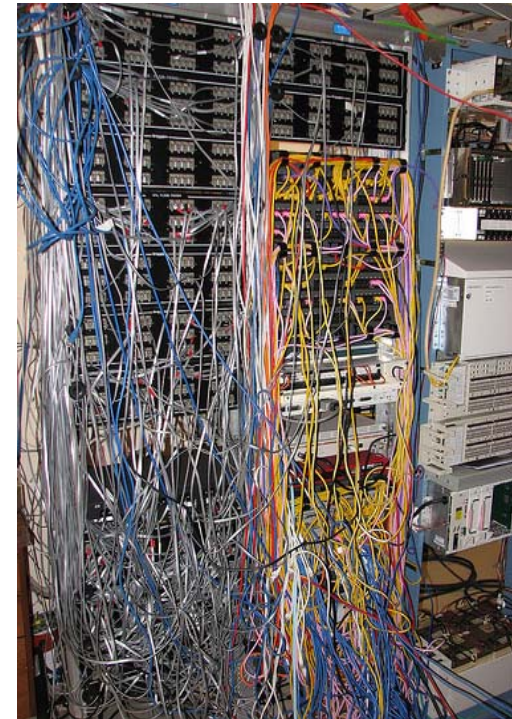


Improving Day 2 Management

1. Improve clarity of roles, authority and practices so change is controlled.
 - Aim to improve control by centralised planning and management
2. Minimise the need to duplicate information from project activities into operational support systems
 - Naming conventions and data formats
 - Use common systems – workflow, infrastructure databases
 - Expect to have to create a baseline at some stage
3. Identify and communicate the benefits – cost, time, staff rotation, incident management, cybersecurity, etc.

Common Challenges

- Time - plan, implement, communicate
- Cost - project delivery, resolving current issues
- People - skills, local knowledge, priorities
- Risk - project delivery, disruption, mitigation
- Process - change approval, handover docs
- Data - inconsistent information sets
- Technical - physical, virtualise, redesign
- Contract - SLAs, penalties, legal
- Conflicts - other projects, “redirection by customer”

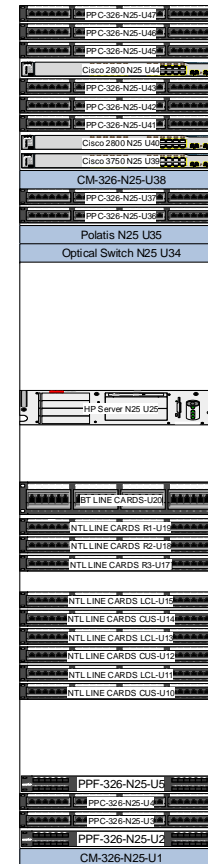
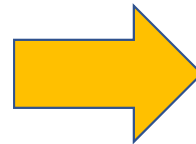
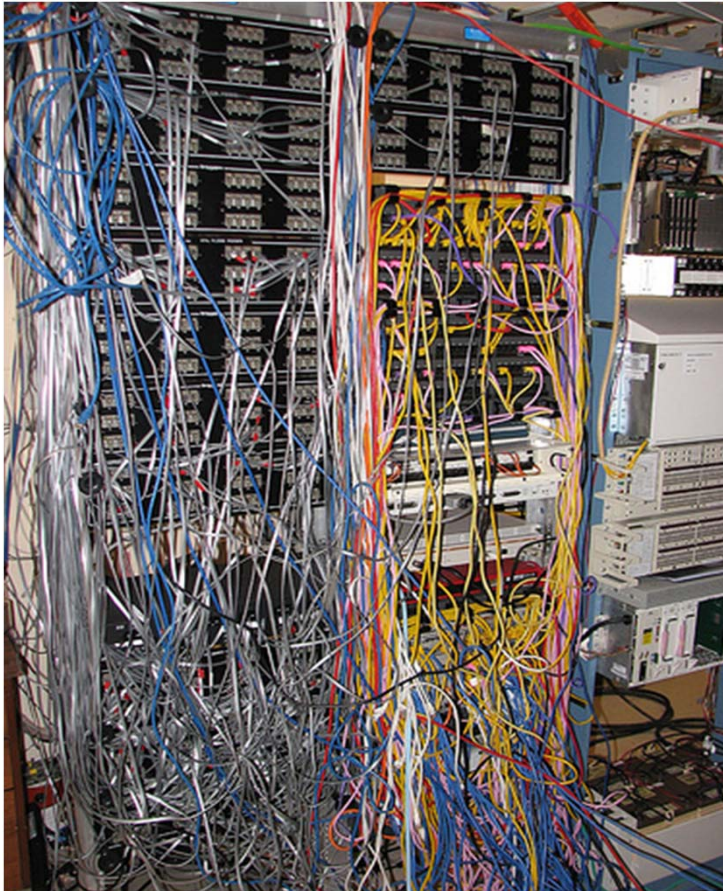


It may take 2 minutes to add a patch cable, but 2 weeks to plan it

You can create a virtual server in minutes, but months to get it signed off

Bicsi

To Make Complexity Easy To Understand – We Simplify



Rack
Diagram



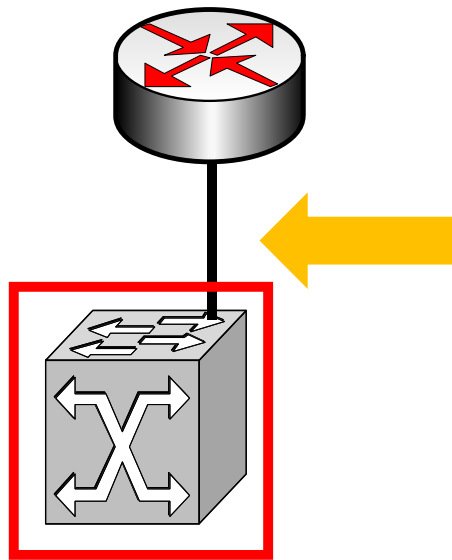
Inventory



Connections



A Connectivity Request



Please connect the router to the switch

Easy to Understand?

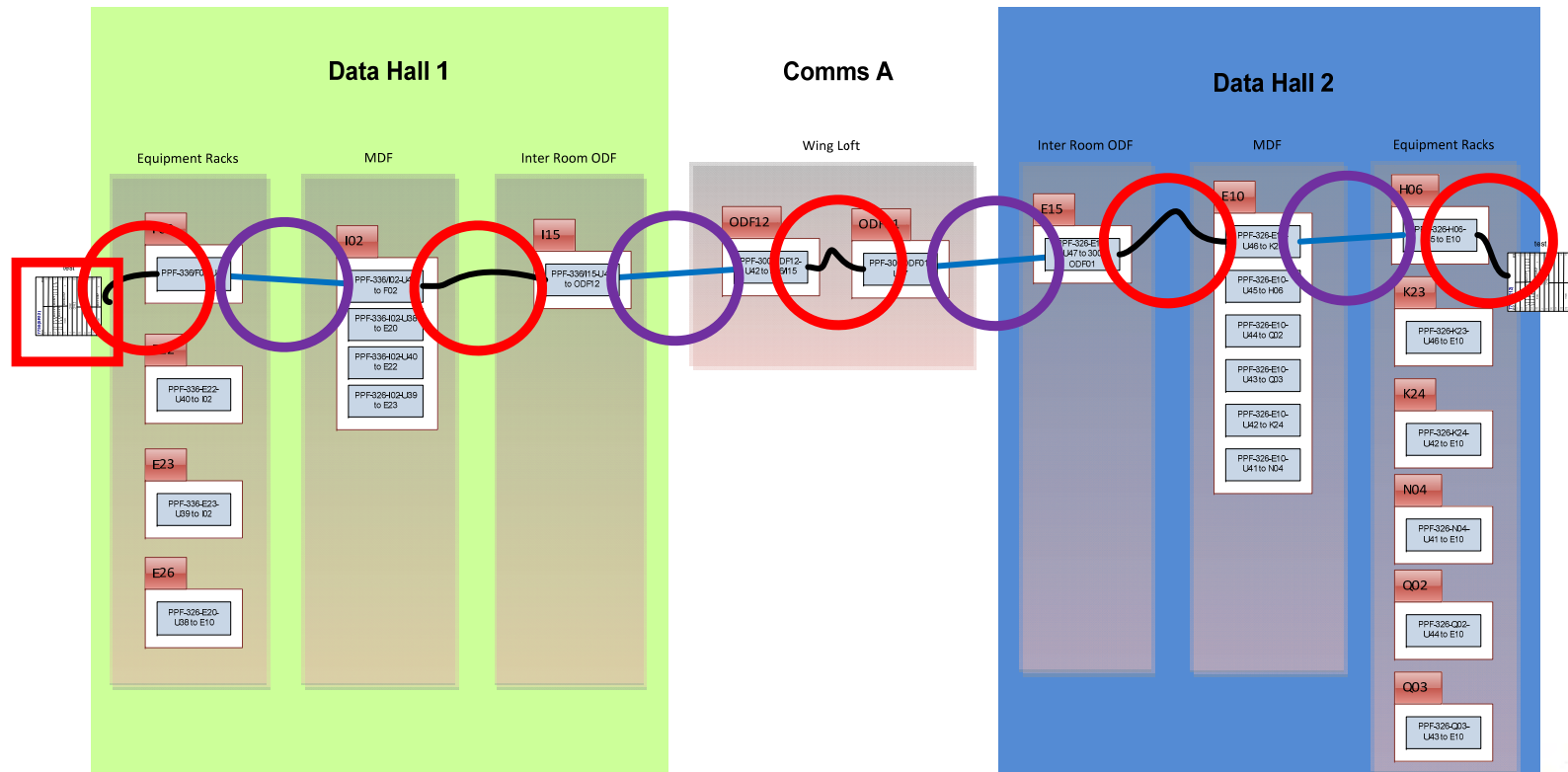
1 or 01 or 001?

2/1 2\1 2/01 SL2/1 Port 2/1 Gig 2/1 Fe2/1 Slot 2/09

Mgmt MGT Con Console ILO Net Mgmt

NIC1 Eth A Net 0 hba0 bge1 12F1 primary

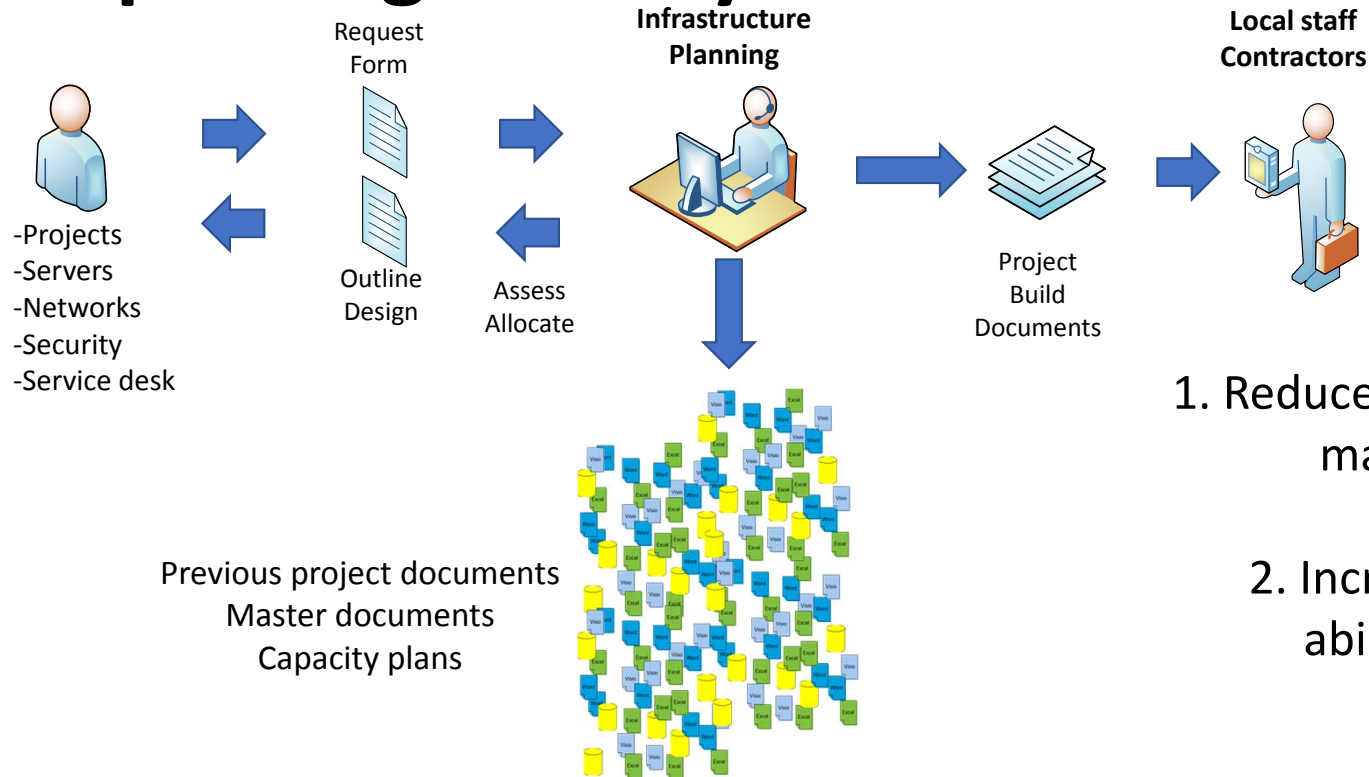
The Physical Build To Meet The Request



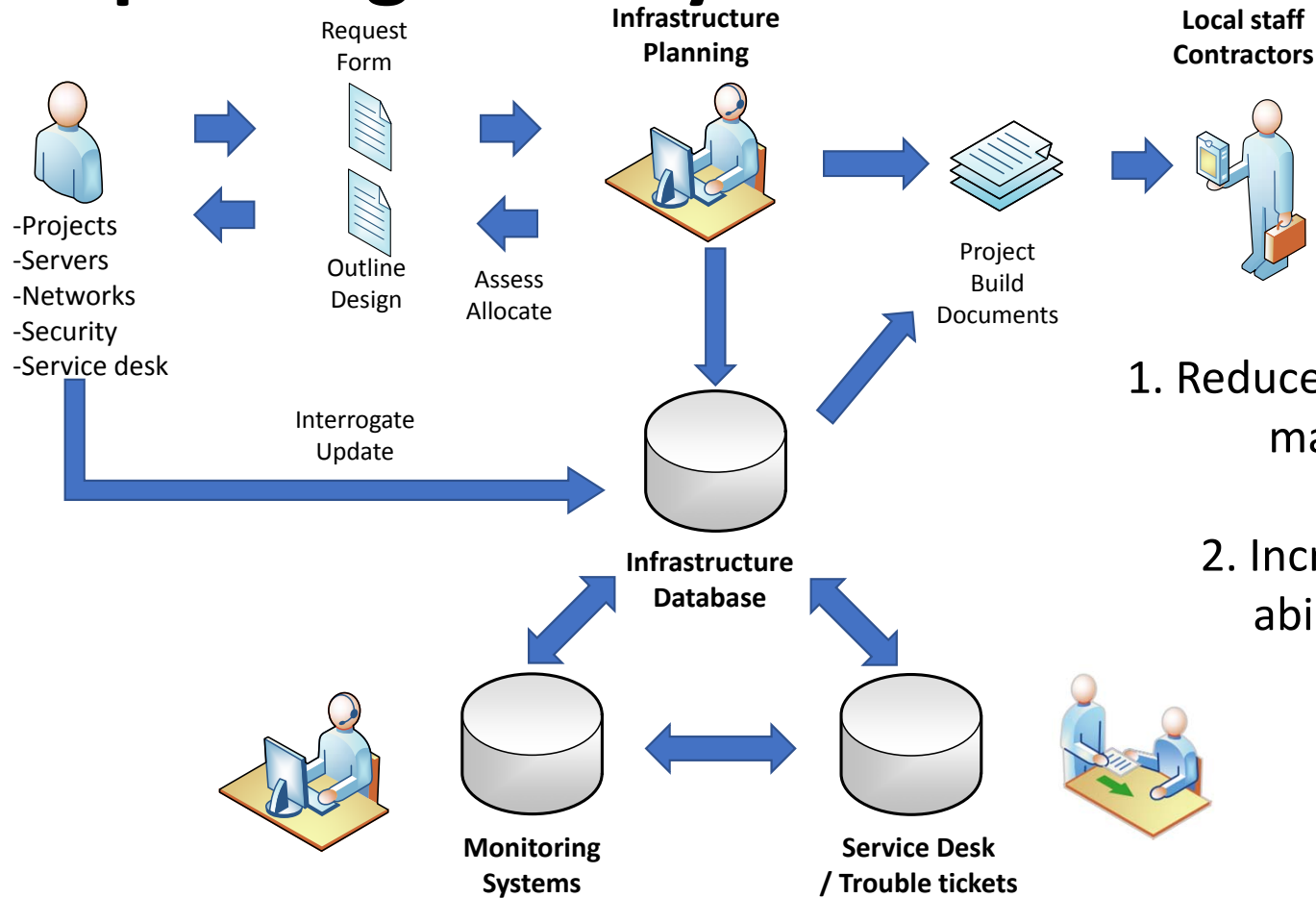
 Backbone

 Patching

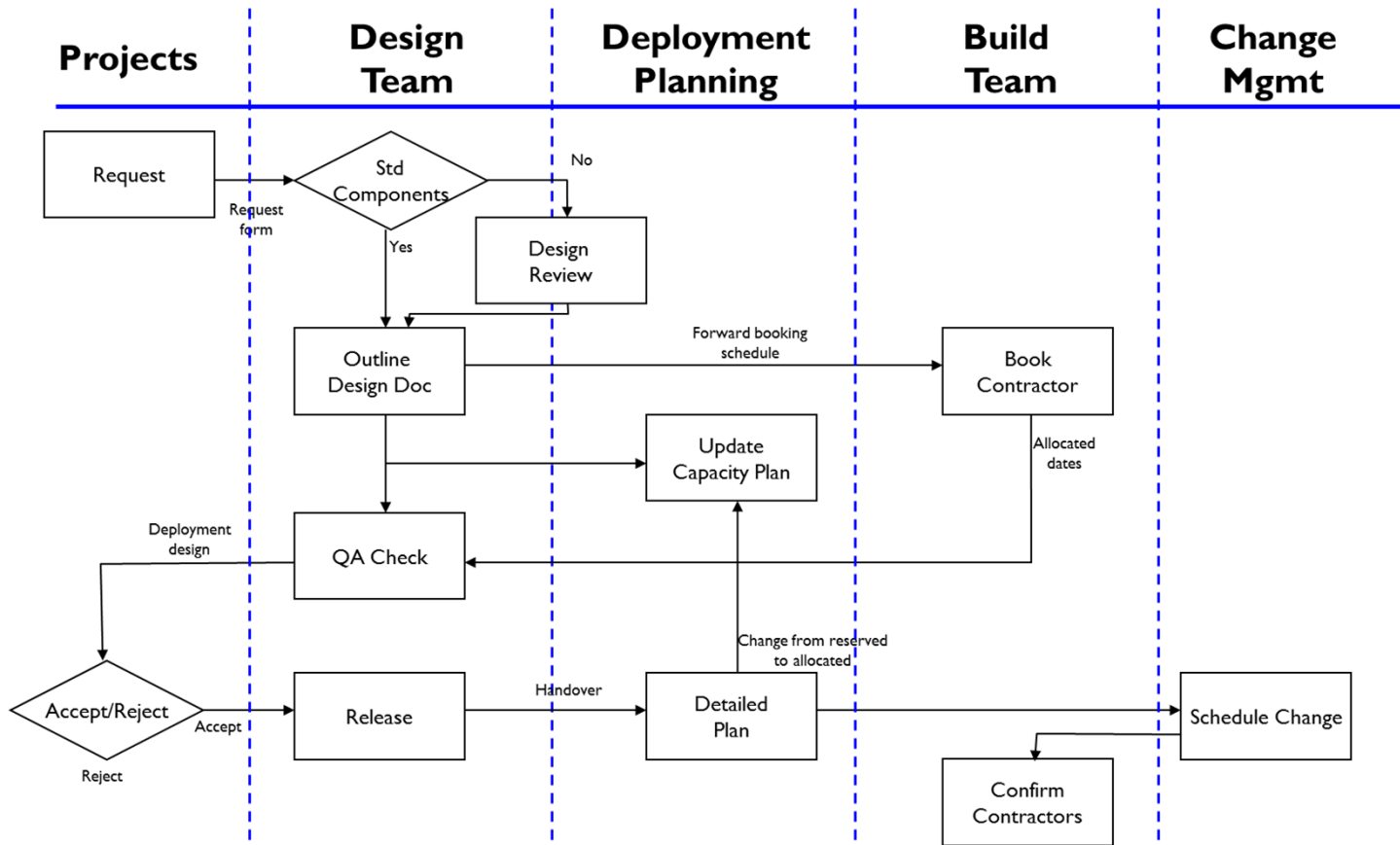
Adopt Integrated Systems and Workflow



Adopt Integrated Systems and Workflow



Optimising Change Processes



What Should Be **RED**, **AMBER** or **GREEN** ?



The CCTV screens have gone blank



I need to install my 20 new servers



We have to rollback yesterdays s/w update as it seems to crashing users PCs



We're pulling out the old CAT 3 cable



This update will disable anti-virus s/w



We are updating the payroll system



We are doing a DC generator test



Need to change the firewall rules



My mobile calendar hasn't been updated



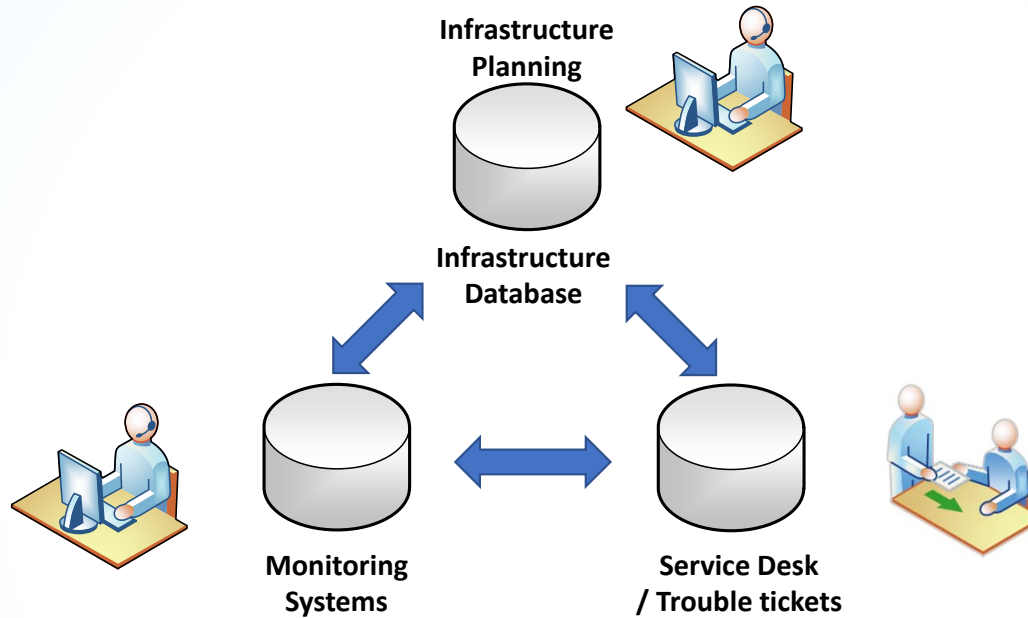
My PC is going slow or has it stopped?



I can't access the server



Urgent, bug fix for yesterdays website crash



Why Change – Write It Down!



WHY

- Cost reduction
- Shorten project delivery timescales
- Support operational troubleshooting
- Flexible use of 3rd parties for local build / support
- Ensure controls are applied globally - consistently

HOW

- Defined roles and interfaces
- Standardised naming conventions
- Baseline audit and resolve non-conformities
- Reduce the number spreadsheets / diagrams using database systems
- Evolving with new technologies

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 - Naming conventions and data formats
 - Use common systems – workflow, infrastructure databases
 - Expect to have to create a baseline
3. Identify the benefits – cost, time, staff rotation, incident management, cybersecurity, capacity, risk assessment, less data breaches

Or... Wait until the next disaster

Thank You

See us on the exhibit stand or visit our web sites



www.assetgen.com

AssetGen System
Infrastructure database
with Visio automation



www.squaremilesystems.com

Documentation methods and audits
Visio automation training
Visio utilities, etc

