Your Time Is Now

Cisco Connect

Portorož, 15. in 16. marec 2017
Managing the Development of IT Infrastructure Solutions

Janez Gruden, CCIE
Director – Operations/Technical Division at SRC
Transformation Or Yet Another Change

Any new significant change threatens to shake up the status quo.

• Transformation (or change) is about accelerating the business:
  • „Digital“ is exploiting new technologies to improve customer experience.
  • Requires thorough consideration of processes; introduces decision making automation.
  • To a greater extent supply-side technology push vs customer demand.
Transformation In IT

Where is the infrastructure?

- **IT application and database departments** create value to users / customers by offering experience through apps supporting business processes.
- **IT infrastructure departments** provide underlying platforms indirectly interfacing users / customers.
- „Going digital“ paradigm is here to be dealt with:
  - Software is a core competency in a digital, hence objective clearer for developers.
  - As for infrastructure, effort should go beyond automation / programmability of existing processes.
Digital Is A New Business – So They Say!

- Continuous Integration
- Optimized Cost
- Continuous Development
- Simplified Processes

Collect data
- Know your customer
- Boost your sales
- Improve your offer

Business Transformation
Making fundamental changes in processes to create value

Business Rules Management
API Management

Programmable Networks
SDN / NFV

Business Process Management

Digital Platform
In the digital economy platform ecosystems are nothing less than the foundation for creating value

Infrastructure
Bimodal IT as a practice of managing two separate modes of IT delivery, one focused on stability and the other on agility

SDN / NFV
API Management

Continuous Development
Simplified Processes

Improved Flexibility

Collect data
Know your customer
Boost your sales
Improve your offer

Business Transformation
Making fundamental changes in processes to create value

Business Rules Management
API Management

Programmable Networks
SDN / NFV

Infrastructure
Bimodal IT as a practice of managing two separate modes of IT delivery, one focused on stability and the other on agility
Most of IT budget is used to maintain the operating environment with great deal of time spent on keeping-the-lights-on

- Existing infrastructure solutions fundamental pillars:
  - Service creation and fulfillment (design, deployment).
  - Service portfolio development.
  - Operating support services (SLAs) following „ITIL“.
Connectivity
Converged Networks/Data Center
Collaboration
Service Resiliency
Private/Hybrid/Public Cloud
Back-up/Recovery
Enterprise Mobility Management
NextGen Firewall
Endpoint Protection
Secure Mail/Data
Networks, Collaboration, Data Centers, Cloud & Service Management, InfoSec Services

IT Service Modelling

Configuration Management (orchestration, automation)

Service Management (business continuity)

InfoSec Provider
SRC Networks & Collaboration
Portfolio Evaluation and Development

Our current offer
- Carrier Transport
- Converged Networks
- Compute/Servers
- Network Management Services

Focus & improvement

Technology onboarding 2017
- Network Programmability/Analytics
- Converged voice, video, messaging
- Wireless Mesh Networking

NEW
- On hold

BASIC
- New technology / vendor evaluation
- Complementary / secondary vendor
- Primary vendor

Complementary / secondary vendor

IP Telephony/Contact Center
- Enterprise Networking
- Data Center Networking
- Optical Transport

Primary vendor

Networks & Collaboration
SRC Data Center
Portfolio Evaluation and Development

Focus & improvement

Data Center Management Systems

Business Continuity (DRCaaS)
IT Service Modeling

Technology onboarding
2017

IT Services Orchestration & Automation
Hyperconvergence
Software Defined Storage

Our current offer

Compute & Storage
Infrastructure Engineering
Virtualization
IaaS (incl. Colocation)
Back-up

Primary vendor

Complementary / secondary vendor

New technology / vendor evaluation

BASIC

NEW

Hewlett Packard Enterprise
Microsoft
Our current offer

- XaaS (CMS, ECMS, DMS)
- IaaS & Service Monitoring
- Identity & Access Management (AD, LDAP)
- SQL, Exchange, SCCM, SCOM, DPM, Skype

Operating Systems Management

Database management

BASIC

Service Management

Focus & improvement

Configuration Management

Service Resiliency

Technology onboarding

2017

IT Services Orchestration & Automation

Cloud Service Integration & Offering

Cloud Operation Management Suite

NEW

Primary vendor

Complementary / secondary vendor

On hold

New technology / vendor evaluation
Our current offer

Secure Connections (SSL, VPN, DA ...)

E-mail Security

Detection & Prevention System

Next Generation Firewall

Antivirus

BASIC

Primary vendor

SIEM

Application Delivery Control

Identity & Access Management (PKI, OTP, AD, LDAP)

User Tracking (Audit Trail ...)

Enterprise Mobility Management

Focus & improvement

Technology onboarding 2017

Advanced Threat Protection (Traffic & Payload Analysis)

Endpoint Protection (Anti-Malware + openDNS)

Application Security

Complementary / secondary vendor

New technology / vendor evaluation

NEW

Hewlett Packard Enterprise

Cisco

Citrix

Palantel Networks

On hold
1. **Service Management:** IT service management
   - Leasing model of IT services with tight SLA maintenance (24/7, 8-12/5)

2. **Operate:** Maintenance, support & monitoring
   - Proactive managed services model with fix time to repair
   - SLA: 24/7, 12/5, 8/5

3. **Support:** Break & fix IT services
   - Reactive support model, fix time to repair
   - SLAs: 12/5, 8/5
What is industry saying we should be doing?

• „Going digital“ for infrastructure means a step towards software:
  • Programming the infrastructure is about provisioning by using software rather than box-by-box manual configuration (objective is to be faster, less prone to mistakes).
  • Implement network functions as software components (NFV).
  • Programmatic control of network instantiated resources (SDN).
  • Expose (to developers) the infrastructure capabilities (REST API,...etc).
A Day In IT Operations - Reality

This is how it looks like in real life and you talk about change / transformation?

- Overwhelming number of service tickets.
- Lack of engineers for daily task.
- High utilization 60+% drives constant hunger for resources.
- Legacy in technology and relations.
- Promising young engineers rebranded to talents, experienced and efficient „old-school guys“.
- Tech-savvy engineers reluctant to deal with processes.
- Broken process or well defined one nobody really follows.
- Tech services turns into end-user support.

Stability vs agility dilemma – how to align operations with development?
Not all engineers are for everything!
A Day In The Manager’s Office - Reality

Do we need to change operating model?

- Companies know where they want to go: new technologies to cut costs, improve quality, transparency and customer experience.
- Application developers are at the front line and business drives them to change.
- Infrastructure departments come second - automating an existing processes will not do, too many flaws.
- Need to improve workload perception.
- Result: while most companies are trying to get better, the results tend to fall short.

Information overload - however need to start somewhere!
Management Consulting Point Of View

What consulting firm says?

New technologies with process-improvement capabilities to improve customer experience and internal processes!

Five approaches and capabilities to drive the next-generation operating model.

- Streamline processes and minimize waste
- Digitize customer experience and day-to-day operations
- Drive the next wave of process outsourcing/offshoring
- Introduce intelligent automation to replace human tasks
- Provide intelligence to facilitate decisions
How Software Companies Are Supposed To Do It?

Software-maturity diagnostic framework.

Any of the software-development principles beneficial to infrastructure?

Fifteen practices help define a world-class software-development organization.

**Setup decisions** that guide the strategic road map
1. Cloud-migration path
2. Platform choice
3. Microservices/container architecture

**Product-delivery practices** to ensure quality delivery
10. Analytics and use of telemetry
11. A/B testing
12. Community-driven development

**Product-management practices** to aid in product conceptualization and design
4. Product-management excellence
5. Human-centric design

**Product-development practices** to build and test quality solutions
6. DevOps (CI/CD$^1$)
7. Test automation and TDD$^2$
8. API$^3$-based architecture
9. Productivity and quality

**Enabling elements** to plan and operate
13. Portfolio management and product economics
14. Talent and governance
15. Product security and risk management

$^1$Continuous integration/continuous deployment.
$^2$Test-driven development.
$^3$Application programming interface.
How Big Guys Doing It?
Cisco Digital Network Architecture

Cisco DNA guiding principles.

Virtualize, analyze, automate and open (API).
Do we need new (next-generation) operating model?

• As for the infrastructure technical departments it is all about getting the job done.
• What matters is efficiency of spending engineers' time (development & execution & process-wise).
• Application oriented infrastructure means “talking to application developers, business, controllers“ therefore we need to broaden the knowledge.

New technologies to improve customer experience and internal processes. Virtualize, analyze, automate and open (API).
Operating Model Change

SRC way: „No need to reinvent the wheel or using sophisticated definitions“

- #1 - R&D, sandbox, competences, stability / agility are just agreements of workflow.
- #2 - Development / maintenance of infrastructure portfolio is to stay; where possible align new technologies with processes.
- #3 - Not necessarily to jump into SDN/API, i.e. begin with automation based on simple scripting tools (learn the profession before bigger stories kick-in).

- Build technical teams (across, not yet with another department) based on fundamental principles:
  - The knowledge of networking, data center, security, service management is as relevant as it was, just pick up new tools!
  - Integrated teams have to be good at multiple things; in disintegrated environment really good at few things - so talk to (in-house) developers / programmers.
1. Use the sandbox to try and **learn new stuff**

2. Focus to **improve quality**, efficiency, and customers’ satisfaction

3. Maintain (hold) when necessary, **never develop** something new

---

**Continuous Development**

- Ansible

**Continuous Integration**

- Python

**Infrastructure Automation**

- Powetshell

---

**Techniques & Methodologies**

**Languages & Frameworks**

**Platforms**

**Tools**
Apply new techniques on processes/services you have under control in the right sequence.

- Understand your processes, standardize and improve them with common sense regarding ITIL.
- Covering up process flaws with yet another technology creates technical debt.
- Measure / analyze what needs to be managed.
- Start small – automate programmable blocks for the processes you control well.
- Cont: „Automation in IT over complicates systems and allows to fail at scale. Work on perfecting the manual process first“.
- Pro: „Perfection never takes place. Use automation in a controlled (process-wise) environment hence improving it.“

See where it takes you!
**Practical Cases for Infrastructure**

- **Case #0:** Streamlining processes and analytics
- **Case #1:** Automation of maintenance contracts reports
- **Case #2:** Managing Hosting IT Services
- **Case #3:** Orchestration of production workflows

Check against management consulting scheme.
Case #0: Streamline Processes

Objective: First take care of internal technical/process-debt

Digital requires information transparency:

• Move relevant communication from mail to IT systems.
• Keep status of presales, projects and service tickets updated and available across departments.
• Automate daily/weekly status updates; clean your desk of service tickets.
• Track utilization of engineering departments.
• Use analytics to plan department activities.

Tools: MARVAL ticketing tool, Jira project traction tool, SharePoint workflows

Business outcome:

• Compliance checks and simplification of existing ITIL procedures.
• Platform of shared information as enabler for cross-functional technical teams.
Case #1: Automaton Of Maintenance Contract Reports

Objective: Automation of preventive SLA reports and configuration analysis

Simple scripts generating reports:
- Preventive verification of routers/switches/protocol statuses.
- Inventory of connected devices.
- Automated MS Word reports with (summary remains subject to engineering).

Tools: Python/SSH, Python -> APIC-EM (future ready for more active role, RESTAPI)

Platform: Cisco

Business outcome:
- Equipment records and their statuses.
- Compliance checks with support contracts.
Case #2: Managing Hosting IT Services

Objective: Managing hundreds of instances in virtualized environment

Managing hosting services:
- Configuration management (servers, virtual machines, application - x100 instances).
- User management profiles.
- Portal for self-configuration of virtual-machine.

Tools: Ansible Playbooks/SSH

Platform: OS/Redhat linux, Virtualization/vmware
Application-serves/Tomcat, Oracle RDBMS

Business outcome:
- Automation of tasks to de-risk changes.
- Compliance checks with regulator requirements.
Case #3: Orchestration Of MS Workflows

Objective: Automation of infrastructure production processes

Automation of provisioning / deployment three infrastructure production processes:

- shared folders,
- new server system,
- operational tests,
- and validation in the form of physical Word documents.

Tools: Microsoft System Center Orchestrator / PowerShell
Platform: Windows Server

Business outcome:

- Development of common engineering criteria for orchestration / automation framework.
- Standardization of processes as baseline for automation and orchestration of workflows.
- Automated construction of custom documents.
Since the beginning of time humankind build on reuse and improve principle.

- Think of digital / automation / programmability as an embedded part of technology portfolios.
  - Interface to talk through to application developers and software controllers / platforms.

- Is it new operating model or as-we-go improvement really doesn’t matter:
  - **Processes**: should go beyond existing processes, thus improve them.
  - **Technology**: follow best practices and pick up tools from developers.
  - **Team**: infrastructure engineers are not to become programmers, however gradually „software compliant“.