The configuration challenge (SCINET)

• Multi-vendor network
• Time (constraints)
• Changeability
• Iterations
• Interoperability
• Scope/size
• Cutting edge hardware/software
How can Automation help @SCINET?

- **Staging**
  - Default configurations
  - NTP, DNS, Hostnames, Users, peering

- **Setup**
  - Provisioning*

- **Show**
  - Automated change rollout

* This years challenge!
How do/did we provision?

• Pre show
  - Connections are requested on booths through the CRS
  - Database gets populated with connections per booth
    - Connection example

• Setup/Show:
  - Then Layer 2 information needs to be filled out.
    - Layer 2 info example
  - Templating
  - Copy/Paste
Issues with this method

• Big iterations once or twice a day
• Consistency
• Headaches
• No overview
• Dependant on just a few people
• SSH copy/paste buffers 😊
Holy grail of configuration changes?

- Idempotency
- Two phase commit
- Rollback possibilities
- Small iterations often
- Anyone can do it
- Reduce human error
- Increase speed of rollouts

*Fully automated configuration pushes*
Demonstration

Super Computing Configuration Generator

- Live Config
- Generate
- Configs
- Rollback ALL
- Rollback menu
How can Automation help @SURFnet

• SURFnet is the Dutch NREN
• Provides connectivity to up to 1.5 million users each day
• Similar challenges to SCINET faces:
  - Base configurations
  - Provisioning services
• Differences:
  - Legacy
  - Larger scale
  - Service chaining
Architecture

- Authentication and Authorization Infrastructure
- SURFnet Network Dashboard
- Orchestration Layer
  - Network Management System
  - Network Management System
  - Network Management System
  - Optical Domain
  - Service Domain
  - NFV Domain
  - ... Domain
  - Business Support System
  - Business Support System
  - Operations Support System
  - Operations Support System
• Workflows
• Defining sources of truth
• Creating a single view on the truth
• Correct modelling of services and products
  - Products
  - Product blocks
  - Resources
Lessons Learnt SURFnet & SCINET

- Data integrity
  - Clean up the data model
  - Keep it clean from that point onwards
- Keep it Simple
- Don’t be afraid to go live 😊
- Take time to invest in the data model
- Automation affects all processes within a business
## Demonstration SURFnet

### Processes

<table>
<thead>
<tr>
<th>Assignee</th>
<th>Step</th>
<th>Status</th>
<th>Customer</th>
<th>Product</th>
<th>Workflow</th>
<th>Started</th>
<th>Last Modified</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYSTEM</td>
<td>Check lichtpad subscription exists in IMS</td>
<td>failed</td>
<td>Avans Hogeschool</td>
<td>Lichtpad (MSP)</td>
<td>lichtpad_opzeegen</td>
<td>11/10/2017, 8:14:00 AM</td>
<td>11/10/2017, 8:18:42 AM</td>
<td>...</td>
</tr>
<tr>
<td>SYSTEM</td>
<td>Send confirmation mail to customer</td>
<td>failed</td>
<td>Avans Hogeschool</td>
<td>Lichtpad (MSP)</td>
<td>statisch_lichtpad_aanvragen</td>
<td>11/9/2017, 9:49:33 AM</td>
<td>11/9/2017, 9:50:49 AM</td>
<td>...</td>
</tr>
<tr>
<td>CHANGES</td>
<td>Approve Request</td>
<td>suspended</td>
<td>Avans Hogeschool</td>
<td>Lichtpad (MSP)</td>
<td>statisch_lichtpad_aanvragen</td>
<td>11/9/2017, 1:38:40 AM</td>
<td>11/9/2017, 1:38:51 AM</td>
<td>...</td>
</tr>
<tr>
<td>SYSTEM</td>
<td>Close JIRA ticket</td>
<td>failed</td>
<td>Hotelschool Den Haag</td>
<td>Lichtpad (MSP)</td>
<td>lichtpad_opzeegen</td>
<td>11/8/2017, 10:09:44 AM</td>
<td>11/8/2017, 10:10:23 AM</td>
<td>...</td>
</tr>
<tr>
<td>SYSTEM</td>
<td>Done</td>
<td>completed</td>
<td>Vrije Universiteit</td>
<td>Lichtpad (MSP)</td>
<td>statisch_lichtpad_aanvragen</td>
<td>11/8/2017, 9:44:21 AM</td>
<td>11/8/2017, 9:45:35 AM</td>
<td>...</td>
</tr>
</tbody>
</table>
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