



Developer Days
Network Services Orchestrator

NSO Developer Days-US!

State of the Union

Fredrik Lundberg

Senior Director, NSO, ConfD and NSO Application Engineering

December 4-5 2019

State of the Union

The State of the Union Address is an annual message delivered by the President of the United States to a joint session of the United States Congress at the beginning of each calendar year in office. The message typically includes a budget message and an economic report of the nation, and also allows the President to propose a legislative agenda and national priorities.



Annual



Priorities, budgets

Source: Wikipedia

Covered today

Where do we come from?

Where are we?

Where are we going?

Fredrik Lundberg

Stockholm, Sweden

- 2010-2014
Tail-f CEO
- 2014 -
Head of NSO
Engineering Team
 - NSO
 - ConfD
 - NSO Applications

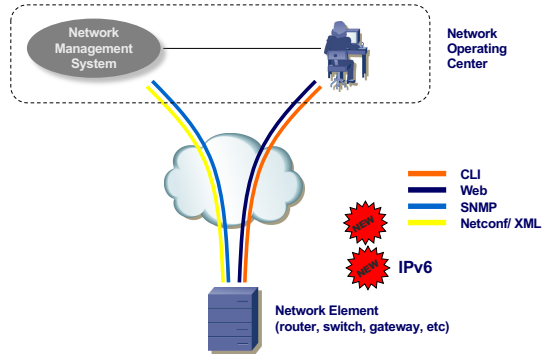
Where do we come from?

Milestone snapshots

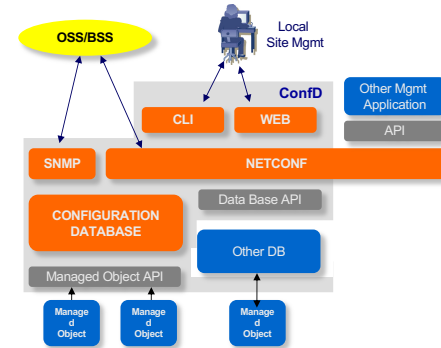
- 2005 – ConfD
- 2009 – NCS
- 2014 – Cisco NSO

2005 Tail-f Started => ConfD

Network Management - tomorrow



ConfD Product Overview



- ConfD fixes Network Programmability by improving the devices
- NMS talk to devices over NETCONF instead of ad-hoc scripts



Hakan, Joakim, Johan, Klacke



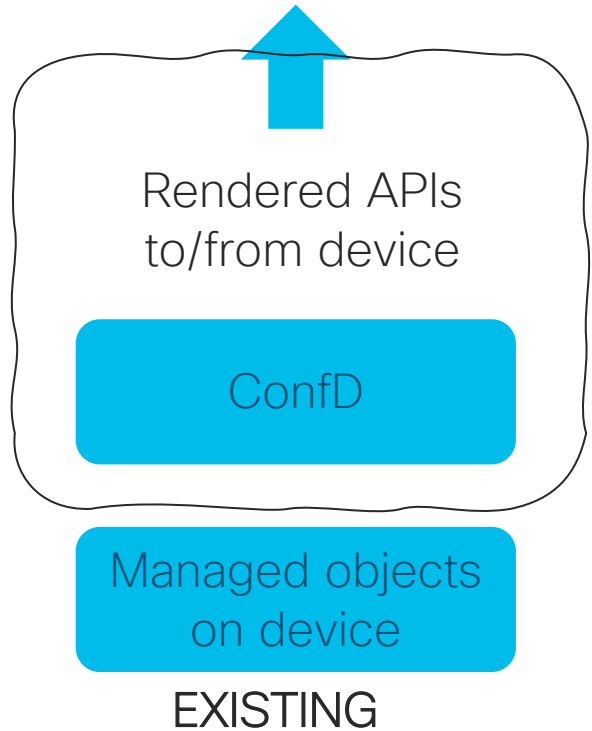
Klacke, Urban, Johan, Joakim, Martin



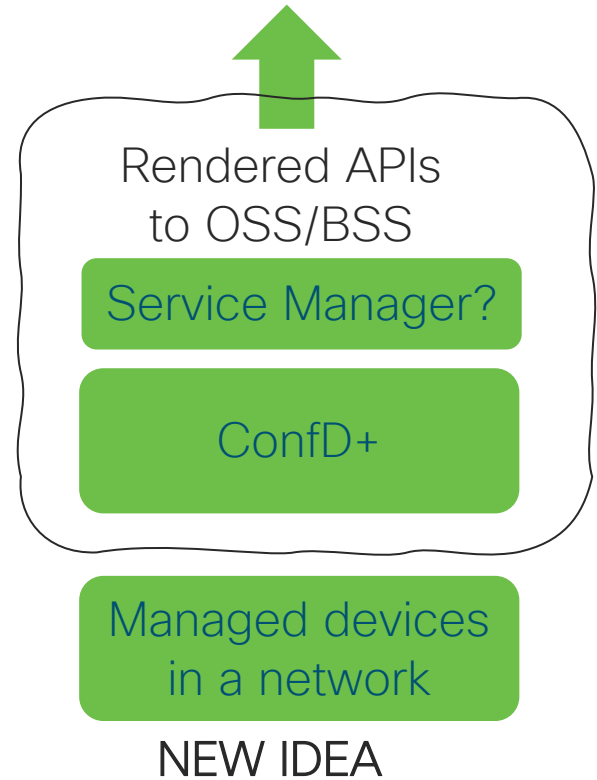
First NETCONF message
Martin, Johan

05-nov-05 15:38

2009 How do we have bigger impact and grow?



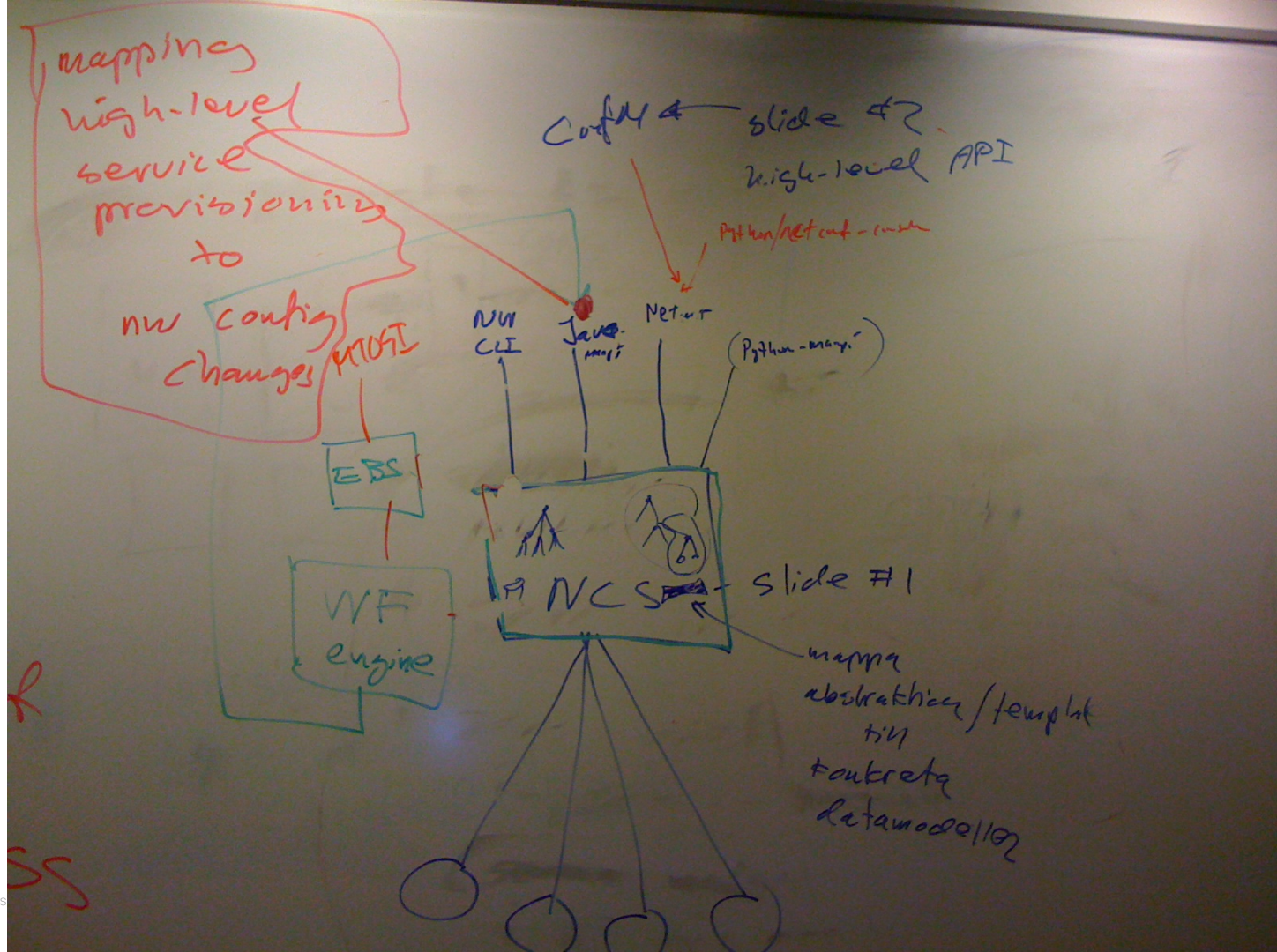
EXISTING
Programmable device



NEW IDEA
Programmable network service mgmt

2009 First NCS whiteboard capture!

Network Configuration Server

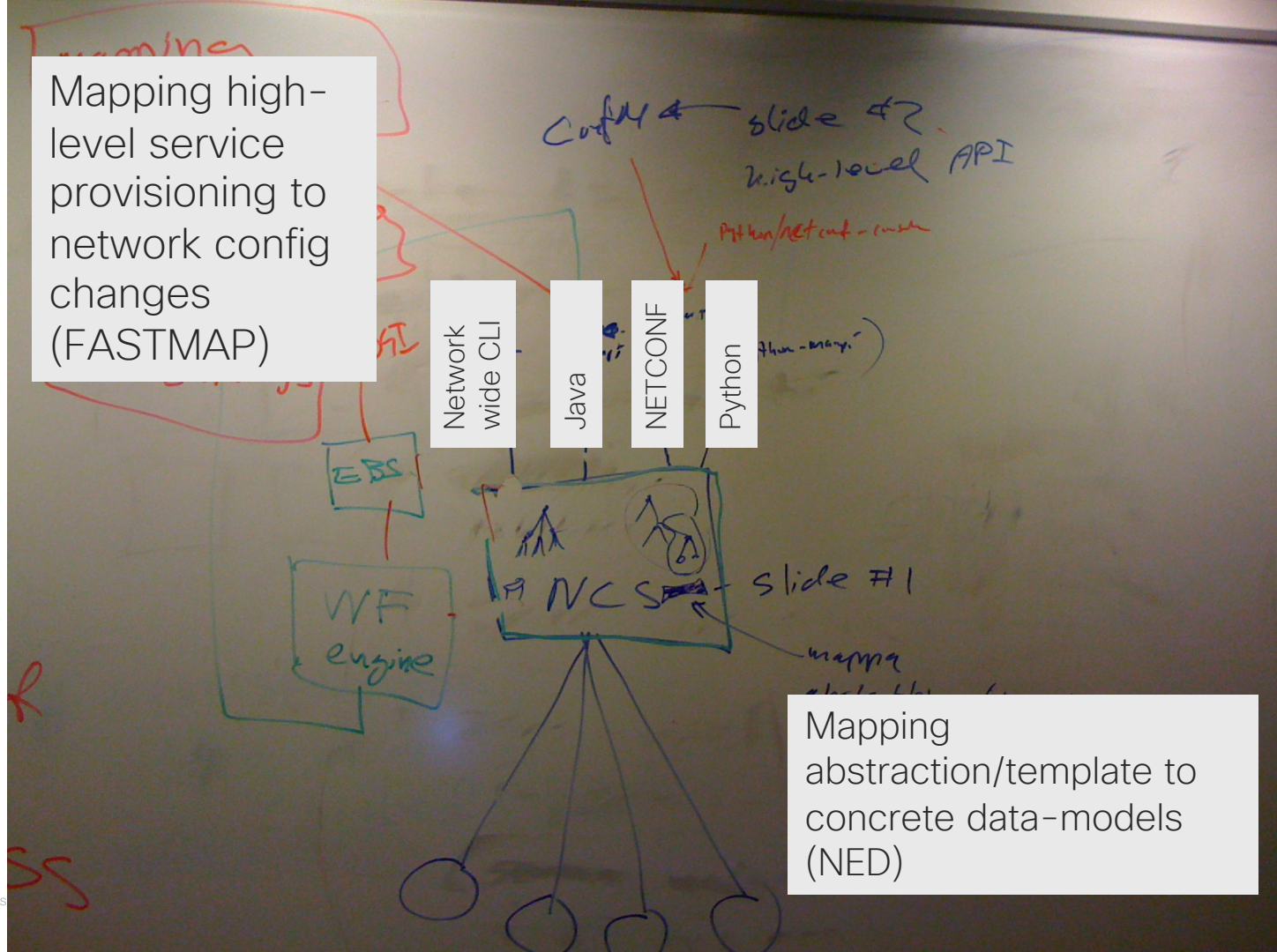


2009
First NCS
whiteboard
capture!

Expand the
scope for
improving
programmabili-
ty to also;

Manage
services in
operator
networks

Mapping high-
level service
provisioning to
network config
changes
(FASTMAP)



Mapping
abstraction/template to
concrete data-models
(NED)

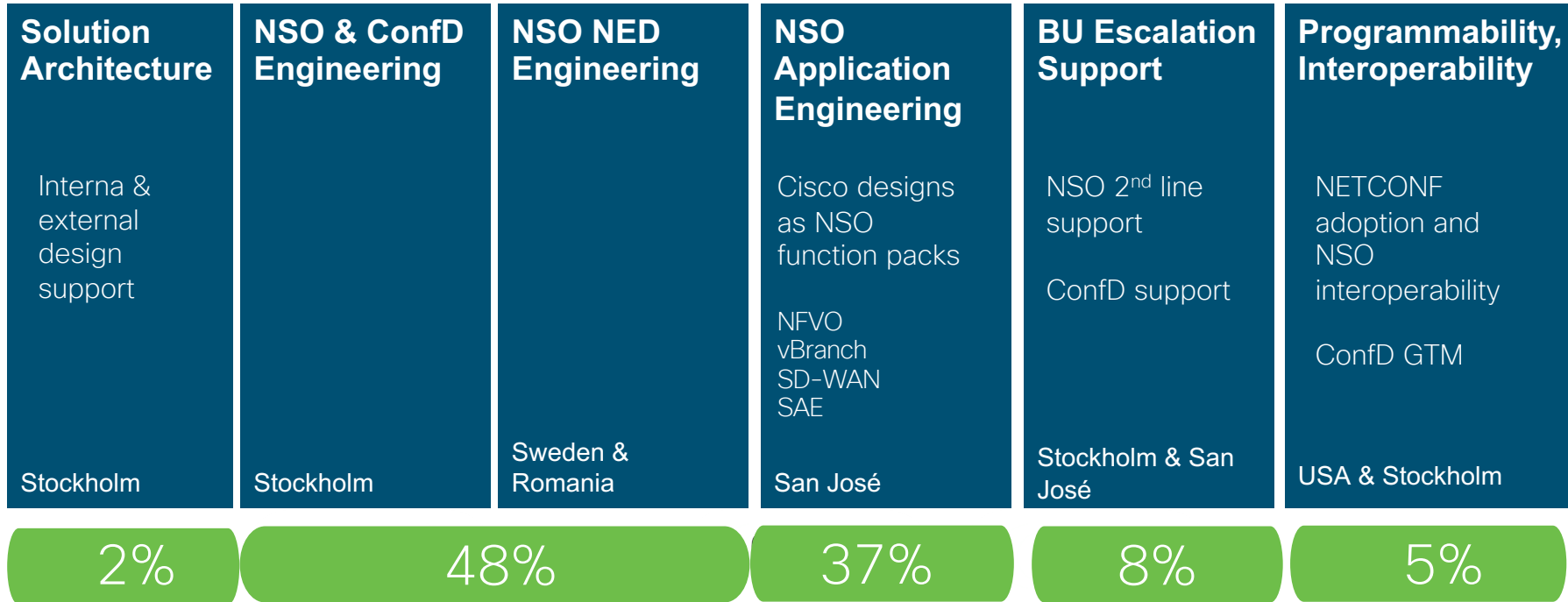
2014 Priorities @ time of Cisco NSO 4.0

- 1 Enable virtualized automated verticals, ETSI MANO and others
- 2 NSO to remain a platform
- 3 Continue driving industry wide programmability
- 4 Multi-vendor support
- 5 ConfD to remain in the market

Where are we?

- High level priorities
- Focus areas

How are BU NSO resources allocated?



Focus areas past 18 months

Core Function Packs	Support for very large networks		
Layered Service Architecture	Python Magic		
Common Data Models	UI that works and rocks		
Memory optimization	Kickers & Plans		
ETSI NFVO	NED portfolio ++		
nano-services	Commit Queues		
RESTCONF	Mixed “transes”		
NED Turbo Parser	ConfD Basic		
Developer Days	Enriched CLI S/N		
Developer HUB	Re-engineered CI/CD		
NADM Netw Auto Del Model	Jira		
Simplified licensing			
TAC integrated support			
Product additions	Additions outside product	Continued work in product	Internal

2014 Priorities @ time of Cisco NSO 4.0

- 1 Enable virtualized verticals, ETSI MANO and others **Yes, but slower start**
- 2 NSO to remain a platform **Yes!**
- 3 Continue driving industry wide programmability **Yes, accelerated especially internally**
- 4 Multi-vendor support **Yes! 75+ NEDs**
- 5 ConfD to remain in the market **Yes, and Basic is free**

Where are we going?

- Focus areas
- Radar observations

Current and Ongoing Focus Areas

Simplification for implementation and use of NSO

Improved system level testing

Strengthened NFVO

More Core Function Packs

Intensified effort to support Infrastructure Programmability

User Community

- Features for users and operators, tooling, especially for brown field
- Packaging experience into best practices and checklists
- Test more end-to-end with more use cases
- ETSI MANO and beyond with Rakuten, Japan leading the way
- Enabling in domain verticals and cross-domain verticals
- YANG and NETCONF across Cisco and the industry
- Continued focus on Developer Hub and NSO Developer Days

What our radars are picking up!

- Automation is a top priority
- Automation teams are increasingly successful
- Non-technical aspects are key to success
- Virtualization is now happening and Rakuten is driving
 - 5G-based systems architecture from day one
 - Fully virtualized from RAN to Core
 - Mobile edge computing for network and services
- 5G is driving a lot of forward looking automation designed in
- NSO is being picked implemented by smaller network operators

