Project FAST

Fully Automated SDN Tester

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Fully Automated SDN Tester

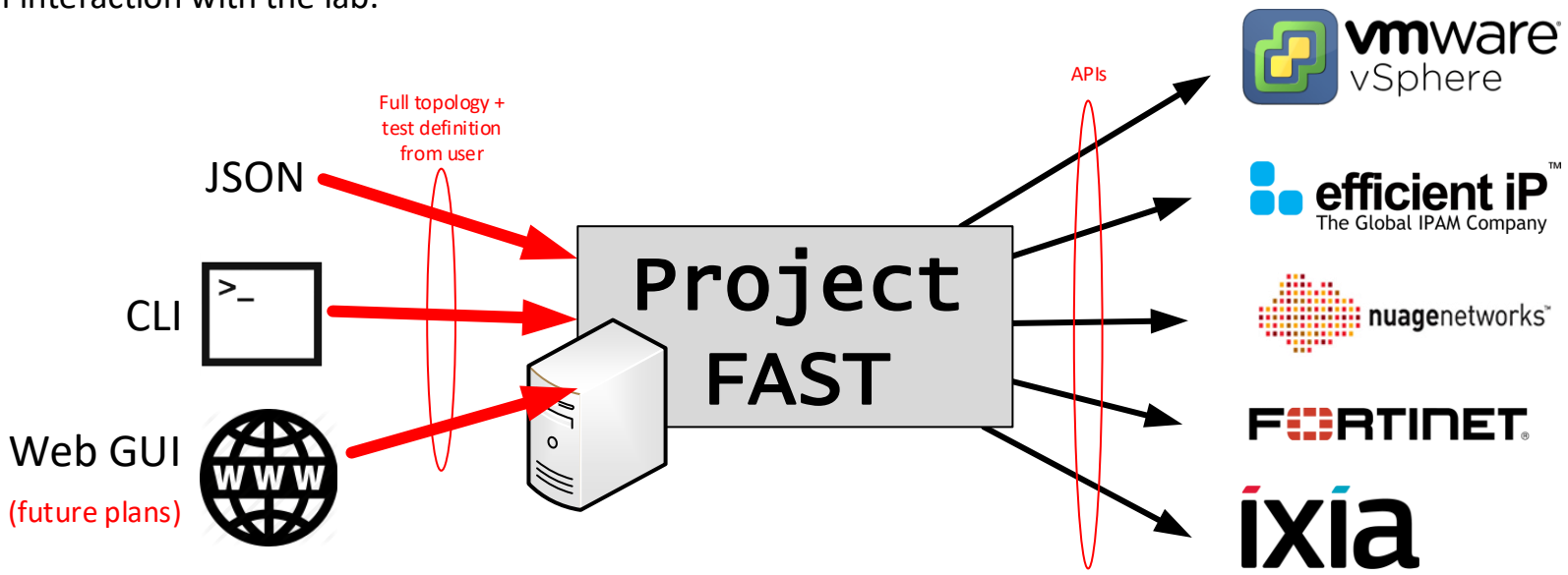
Motivation:

Next Gen VPC lab complexity was raising exponentially since the beginning of the project and with the amount of scenarios/test cases that all demand logical re-configuration of a customer network and from time to time also re-configuration of physical components this became complete waste of time using visual GUI. Combined also with non-coherent connectivity tests (practically taking random ping combinations between VMs/PMs as proof of working/not working, we have an inherit weakness depending on human operator not making mistakes when running the same set of tests with only slight deviations (e.g. switching vmware parameter and re-test a full set of scenarios).

Therefore project began as small self-initiative of VPC's BTV network engineering team to programmatically control :

- **Nuage/DCN**
- **vmware environment (including simplified provisioning)**
- **(*in progress*) EfficientIP's IPMAN/DNS**
- **IXIA's IxChariot connectivity testing software**
- **(*in progress*) Fortigate FWs as NFV boxes**

and provide JSON interface to define whole customer structure, VMs/PMs to be deployed and test to be conducted all without manual interaction with the lab.



Project FAST – Deployment in NextGen LAB

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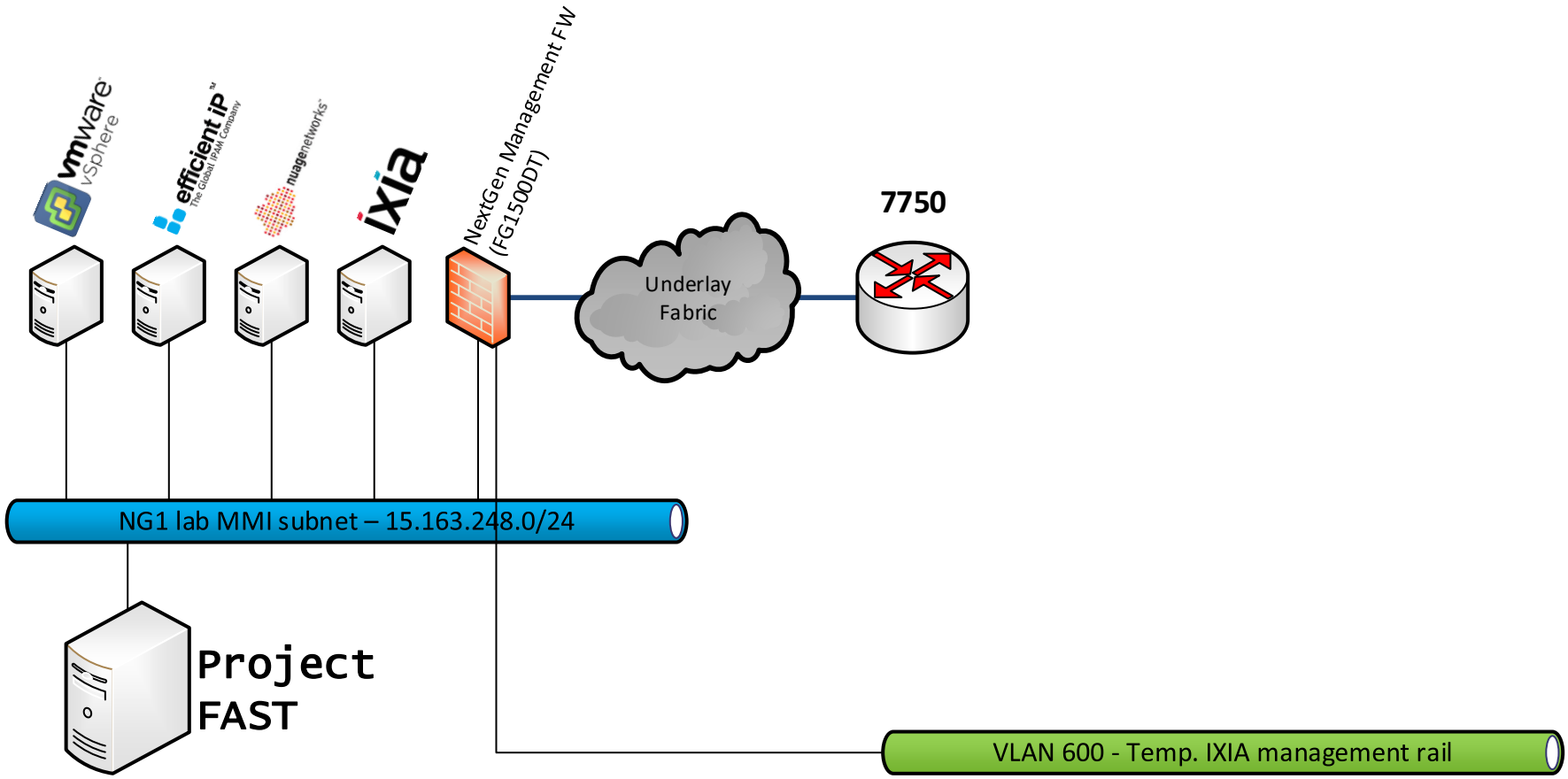

Step #0:
Prepare JSON definition for all customer topologies, positions of VMs/PMs and ixia tests to run on top of it.

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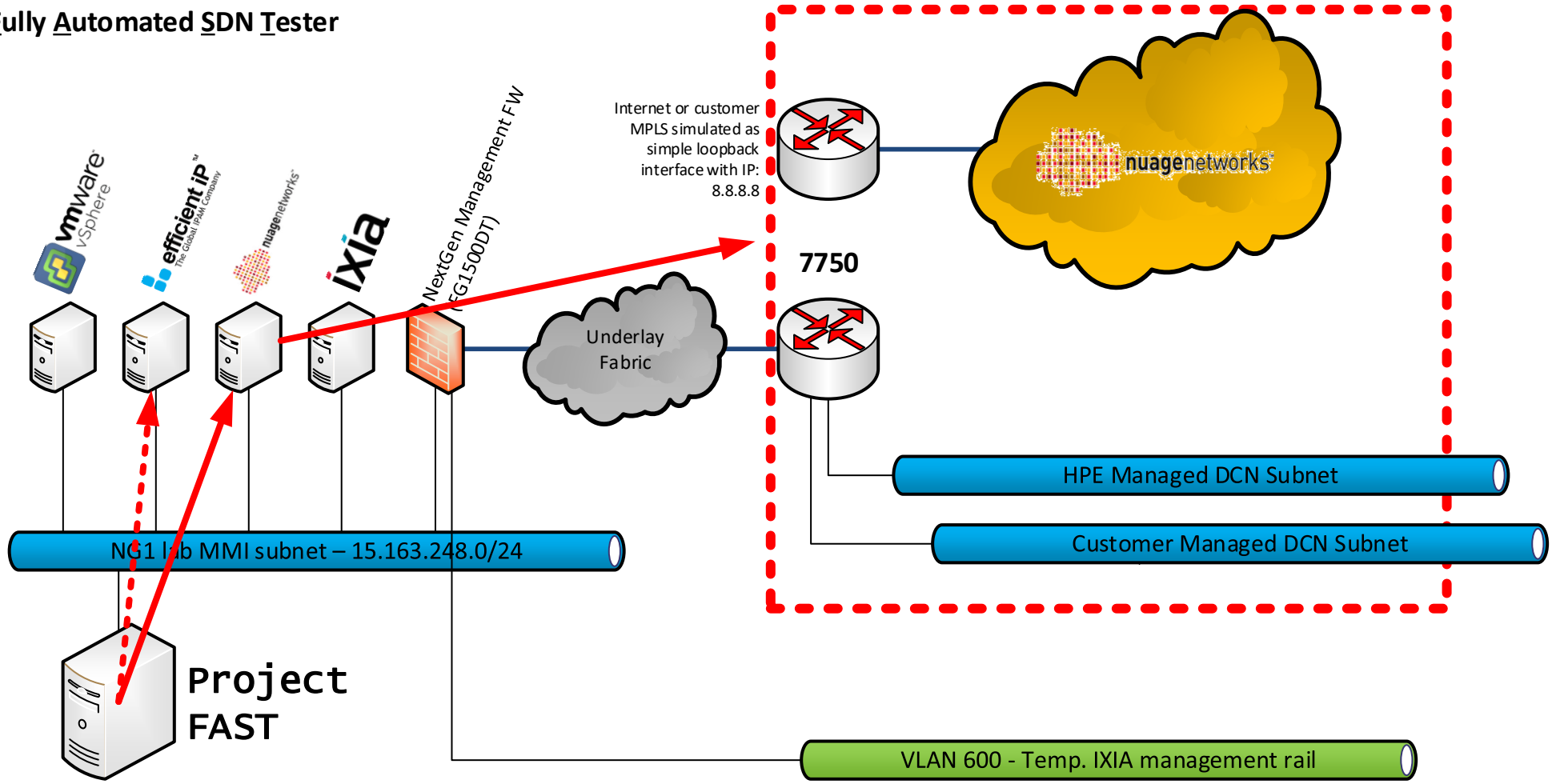

Step #1:
- FAST will take in a JSON definition (or step by step via CLI for rapid prototyping) and deploys a full overlay network environment, this includes:
-- Security-zones (L3 Domains)
-- DCN subnets (both customers and HPE management rails)
-- Routing / Domain-linking / ACLs
-- L3 VTEP control
-- DC Gateway (7750) control
(optional, needs further development) register all overlay IPs in EfficientIP

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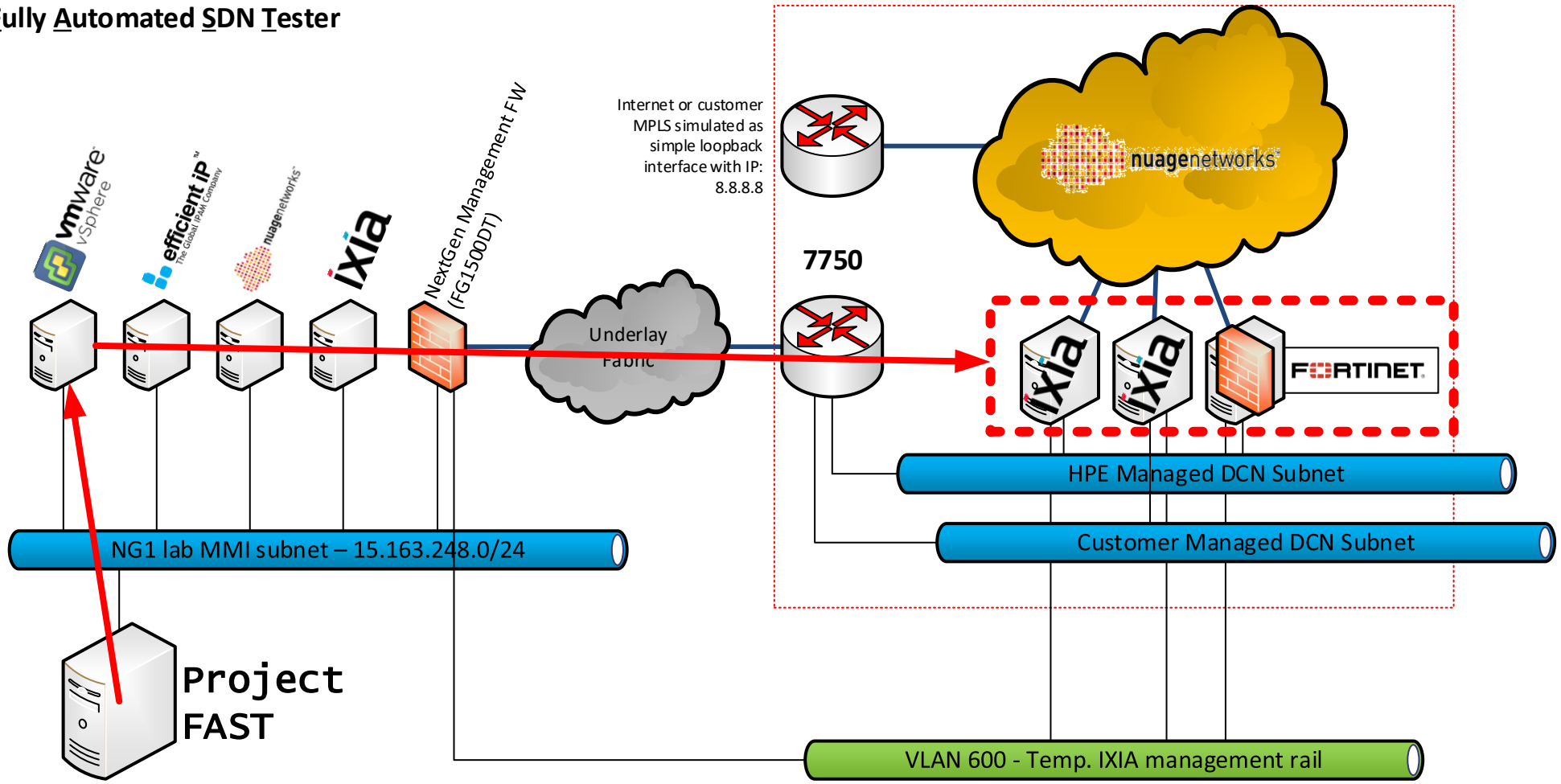

Step #2:

- FAST communicate with vmWare vCenter and will deploy several VMs using special template (ProjectFAST will provide heavily modified linux image with IXIA traffic generators and other network troubleshooting tools) and instantiate these in the lab with minimum of three interfaces:
-- Production Overlay interface (DCN controlled)
-- Management Overlay inteface (DCN controlled)
-- Special traditional underlay interface bypass to IXIA management vlan (vmware controlled with API controlled IP)

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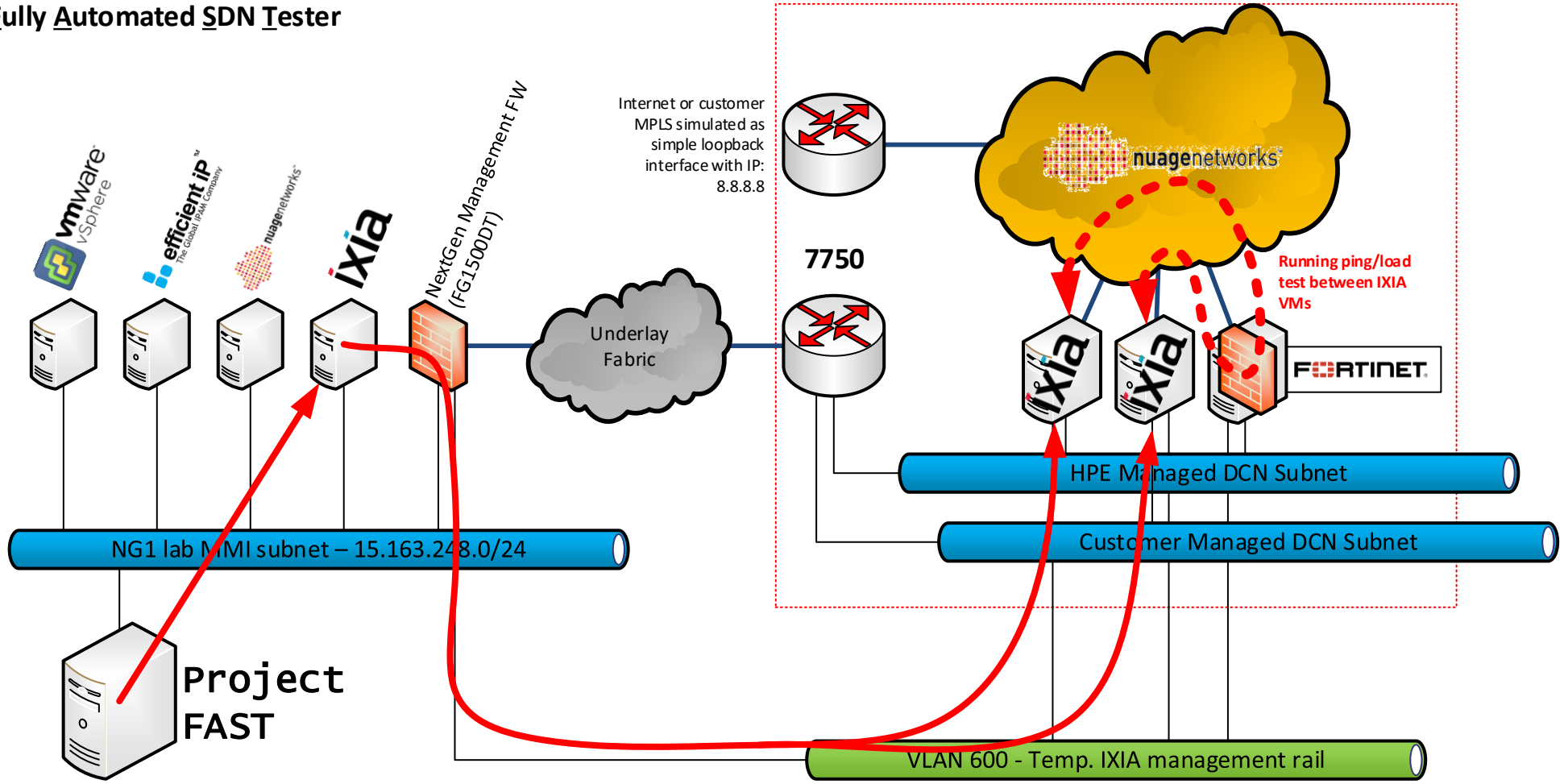

Step #3:
- FAST will next activate tests using IXIA IxChariot APIs and contact all dynamically created endpoints to run tests (at minimum ping/connectivity and possibly also load-tests) via non-standard VLAN. And collect results.

Project FAST – Current Status (Mar 2017)

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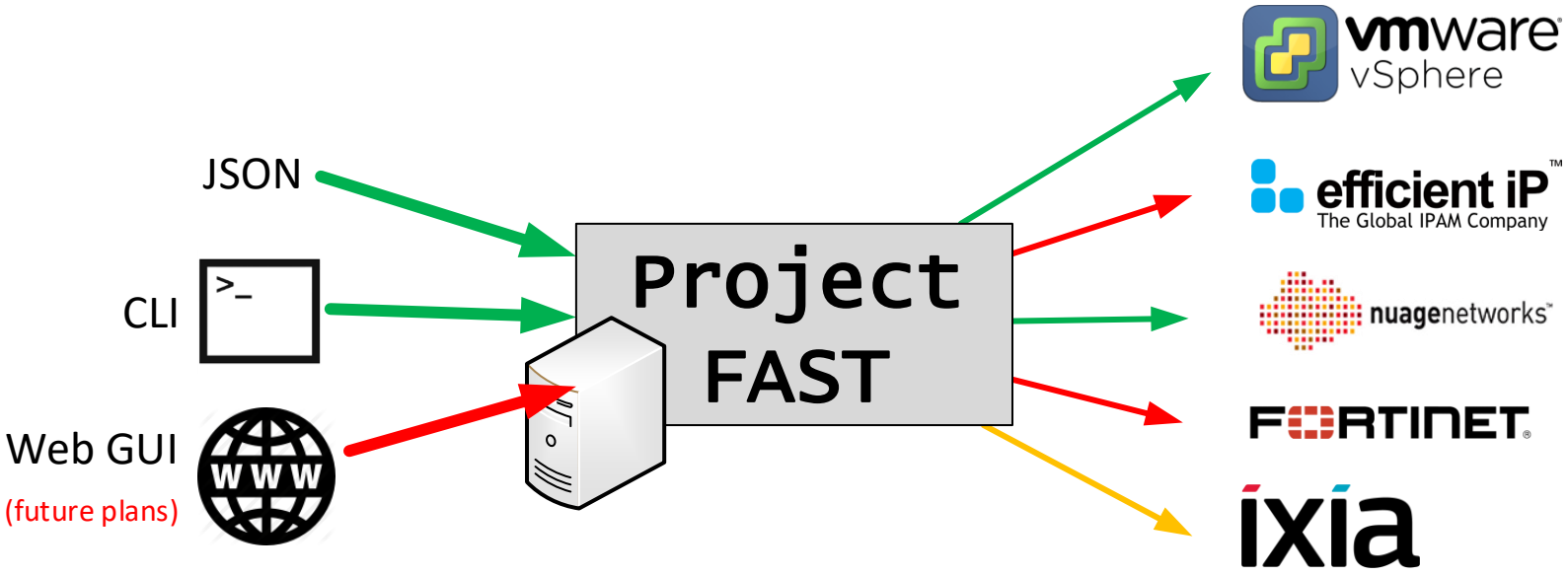
Today we are capable of relatively competent interaction with Nuage and vmWare to deploy flexible customer topologies and put vmware VMs into the environment. And provide to users both JSON interface for full automation and CLI interface for more granular control(see attached document with examples)

Currently in alpha is interaction with IXIA's IxChariot as we are only recently implemented this interface and we are capable of only running simple full connectivity (ping based) tests to check full routing inside customer overlay networks. Further development is needed.

Other API interfaces or user interfaces are either non-existent yet or are in first experimental stages (like Fortinet control). Further development/prioritization will be dependent on prioritization during Next Gen project.



Project FAST – Live DEMO (Topology)

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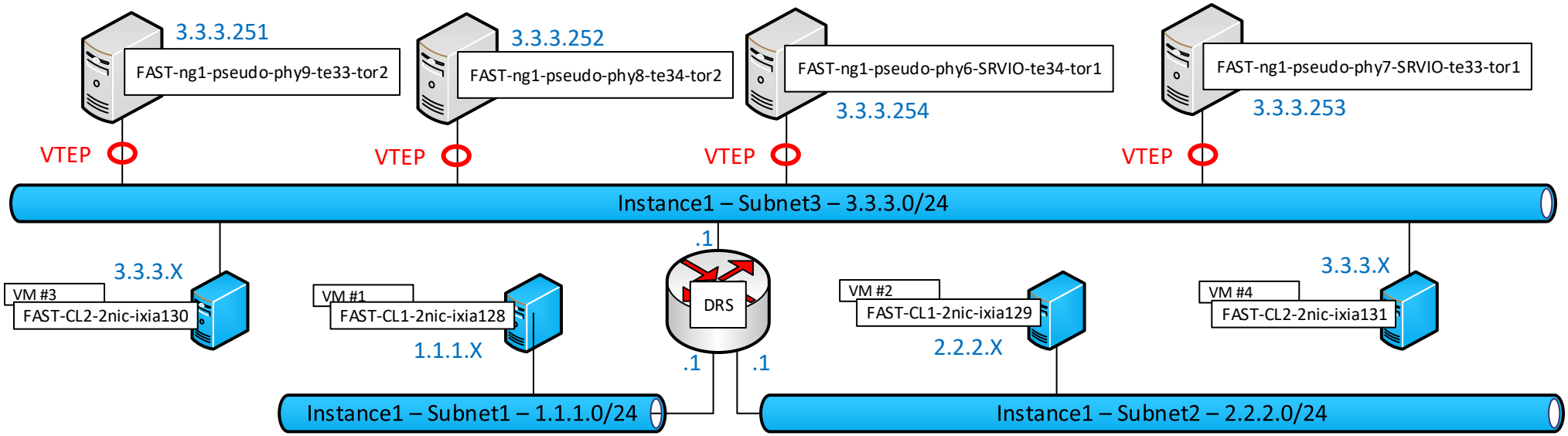
This is the topology we will use in our DEMO:



DCN's L3 Logical

Physical / Underlay