



# The Changing Role of Cloud Servers

What are the concerns of different parties to meet the growth in cloud deployments?

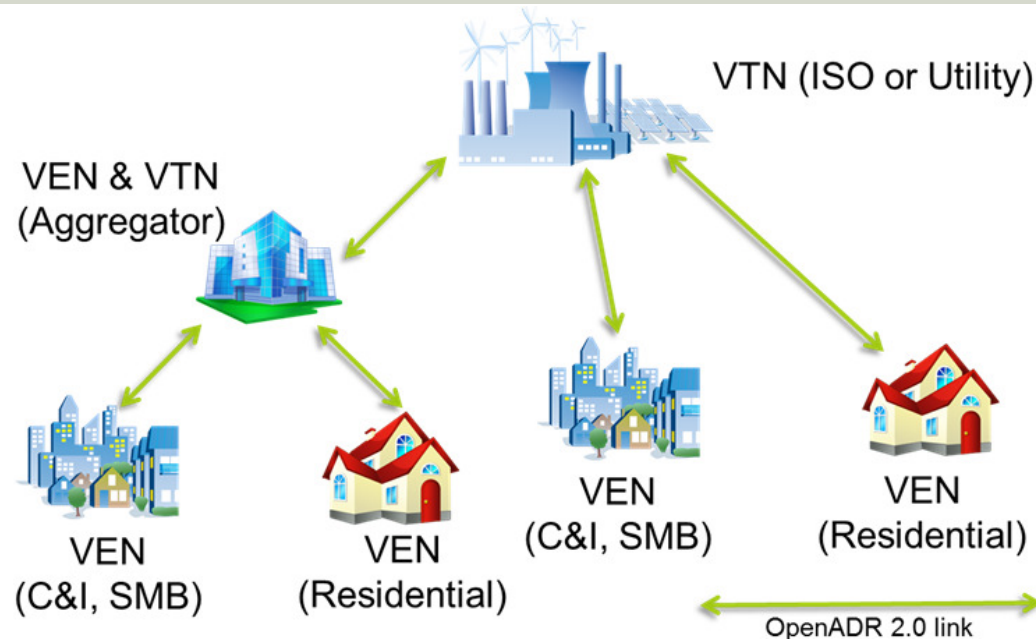
Where can cloud services exist in OpenADR implementations?



# Concerns from Different Perspectives

- Customers (through vendor offerings) are embracing the cost effectiveness and simplicity of cloud-based solutions  
...but this needs to be balanced with...
- Utilities' need to address resource reliability and long-term availability of services, esp. where rate-payer funded incentives are provided to encourage adoption
- **The purpose of the panel discussion is to understand differing parties perspectives and suggest ideas to enhance DR participation using cloud solutions**

# Potential OpenADR Cloud Elements



- Any endpoint (VEN or even VTN) could be implemented as a cloud based service
- VENs are the primary concern, since ultimately, load control devices need to respond to VTN requests whether they receive a direct or “translated” (to their local protocol) request from a VTN

# Panel Discussion

- ▣ **Albert Chiu, Pacific Gas & Electric**

*Senior Program Manager, Demand Response*

- ▣ **Carl Besaw, Southern California Edison**

*Senior Project Manager, Mass Market Solutions, New Program Development & Launch*

- ▣ **Mark Kerbel, REGEN Energy**

*Co-founder & EVP Business Development*

- ▣ **Peter Hunt, SmartCloud**

*Director of Sales, Energy & Utilities*

# Cloud based solution pros and cons (utility perspectives)

## ■ Pros

- When the cost benefit becomes a barrier if the VEN client is built within the devices
- Program design options
- Interoperability risk

## ■ Cons

- Stranded Assets
- Cost to use the “toll road”
- DR signal liability
- Program M&E



# Why Cloud based Solutions?

- Intelligence moved from devices to the cloud
- Lower cost devices (not as intelligent, no EMS, etc.)
- Solution for Small Commercial Customers
- Leverages existing OpenADR infrastructure
- Simpler Installation
- Easier Upgrades



# Cloud Considerations

- Security
  - How does the security of DR cloud solutions compare to Financial and other security conscious institutions?
  - What are the risks associated with a potential breach?
- Stranded Assets
  - Do lower cost solutions mitigate this concern?
  - What is the potential for connecting devices to an alternative cloud?
  - Can this concern be mitigated with contractual obligations?
  - What if the cloud provider becomes a DR aggregator?
- OpenADR 2.0b capabilities
  - Can a cloud based solution implement 2.0b capabilities?
  - Are vendors willing to provide feedback on a per device level to an aggregation point in the cloud?

# Range of C&I Deployments



Utility / Load  
Aggregator  
Dispatch

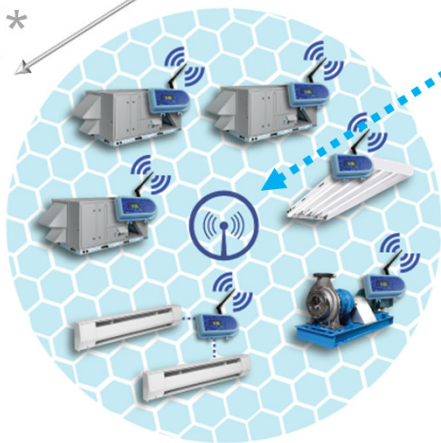
VTN

VEN



Swarm Energy  
Cloud

VEN\*



Mid & Large Buildings  
Integrated Controls



Small Buildings  
IoT Devices



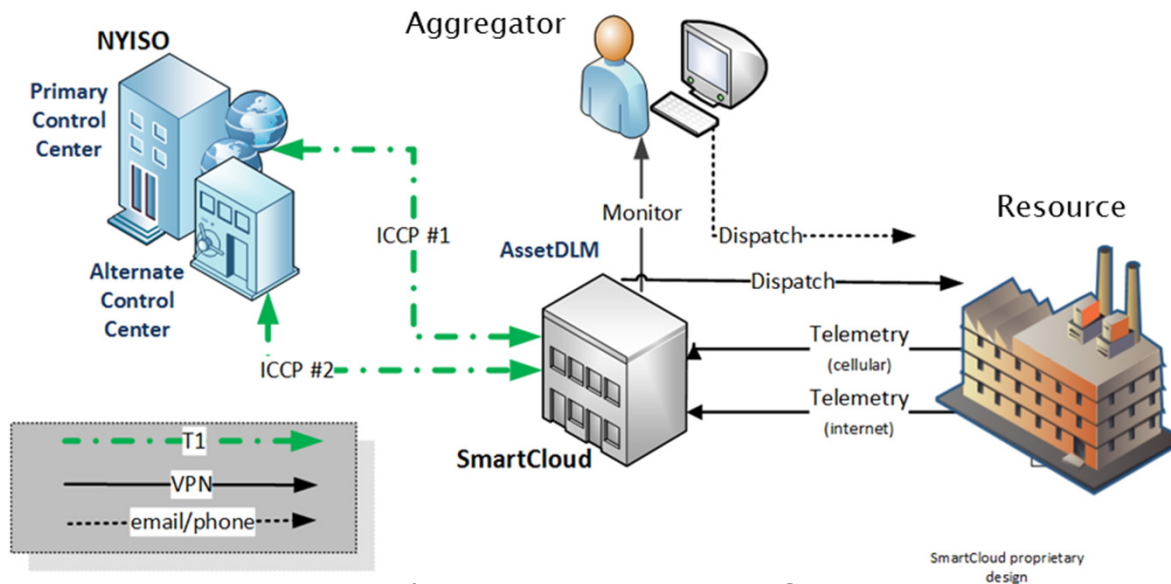


# SmartCloud - DR Applications

- SmartCloud founded in 2009
  - DR applications since 2010
  - Rockwell Automation investment in 2013
  - Deep experience in software and systems integration for mission critical data & decision management
    - Real-time, expert systems, artificial intelligence (AI)
- Hosting: Cloud and/or NERC-CIP environment
- SmartCloud DR role:
  - DRAS (Demand Response Automation Server)
  - Broker between loads, dispatching entity and the ISO

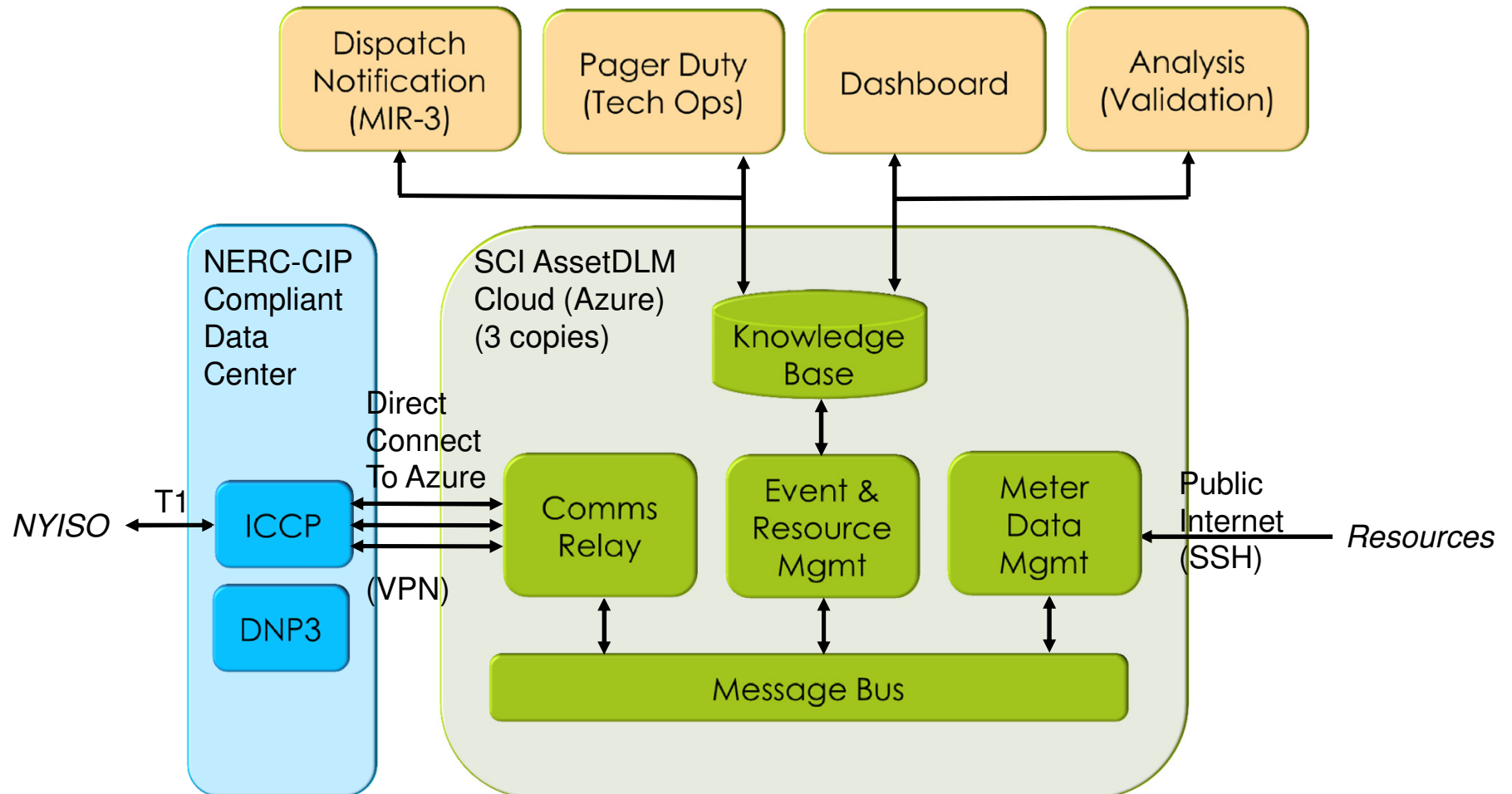


# Example: NYISO DSASP (Demand Side Ancillary Response Program)



- Capture real-time telemetry from energy consumers
- Simultaneously receive DR commands from NYISO
- Reasoning applied in real-time for aggregator to issue curtailment notifications and track actual curtailment performance for aggregator (logs)
- Match bids every 6 seconds

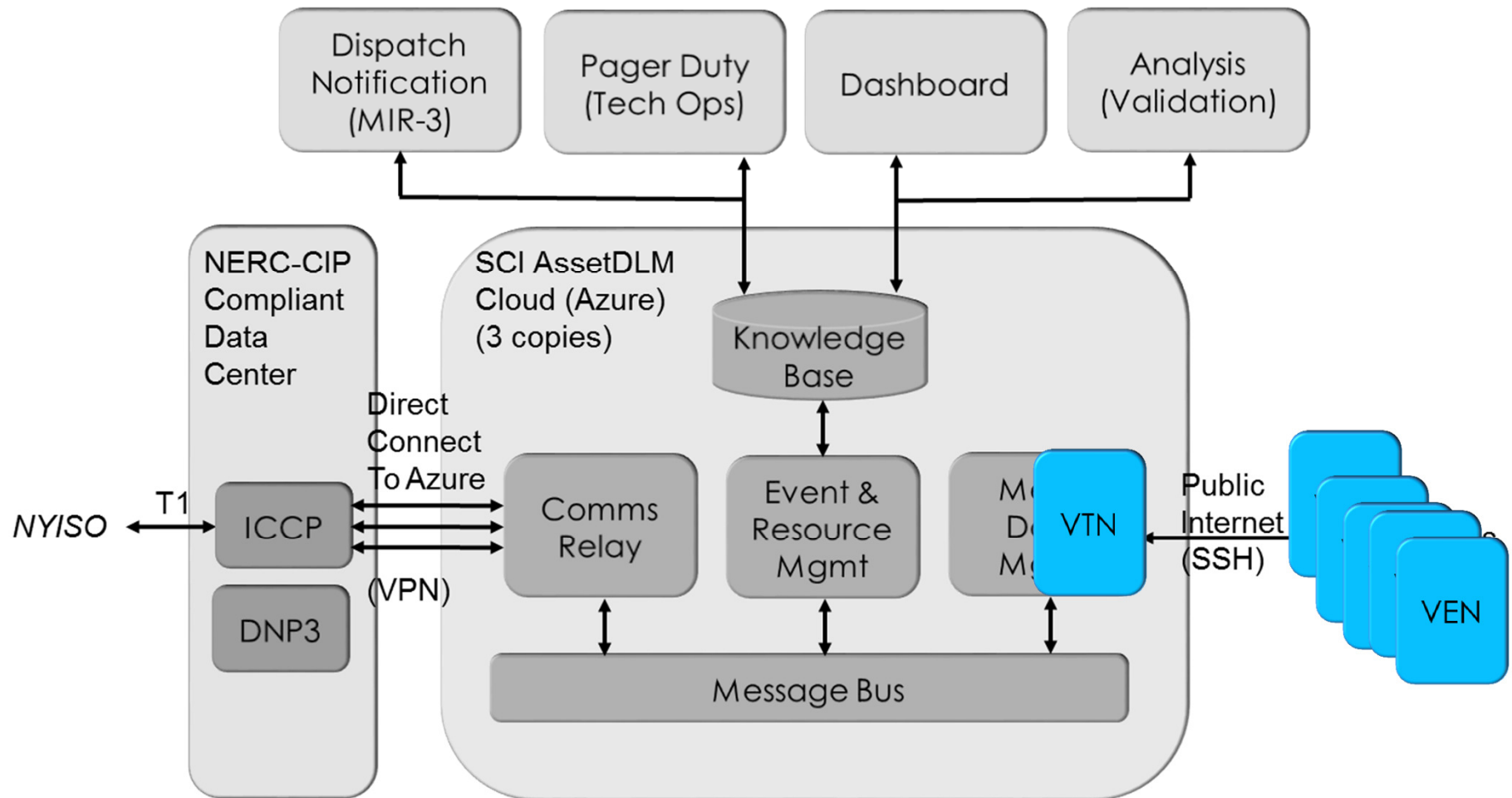
# Current: Industrial (no OpenADR)



■ Traditional DRMS in NERC-CIP environment

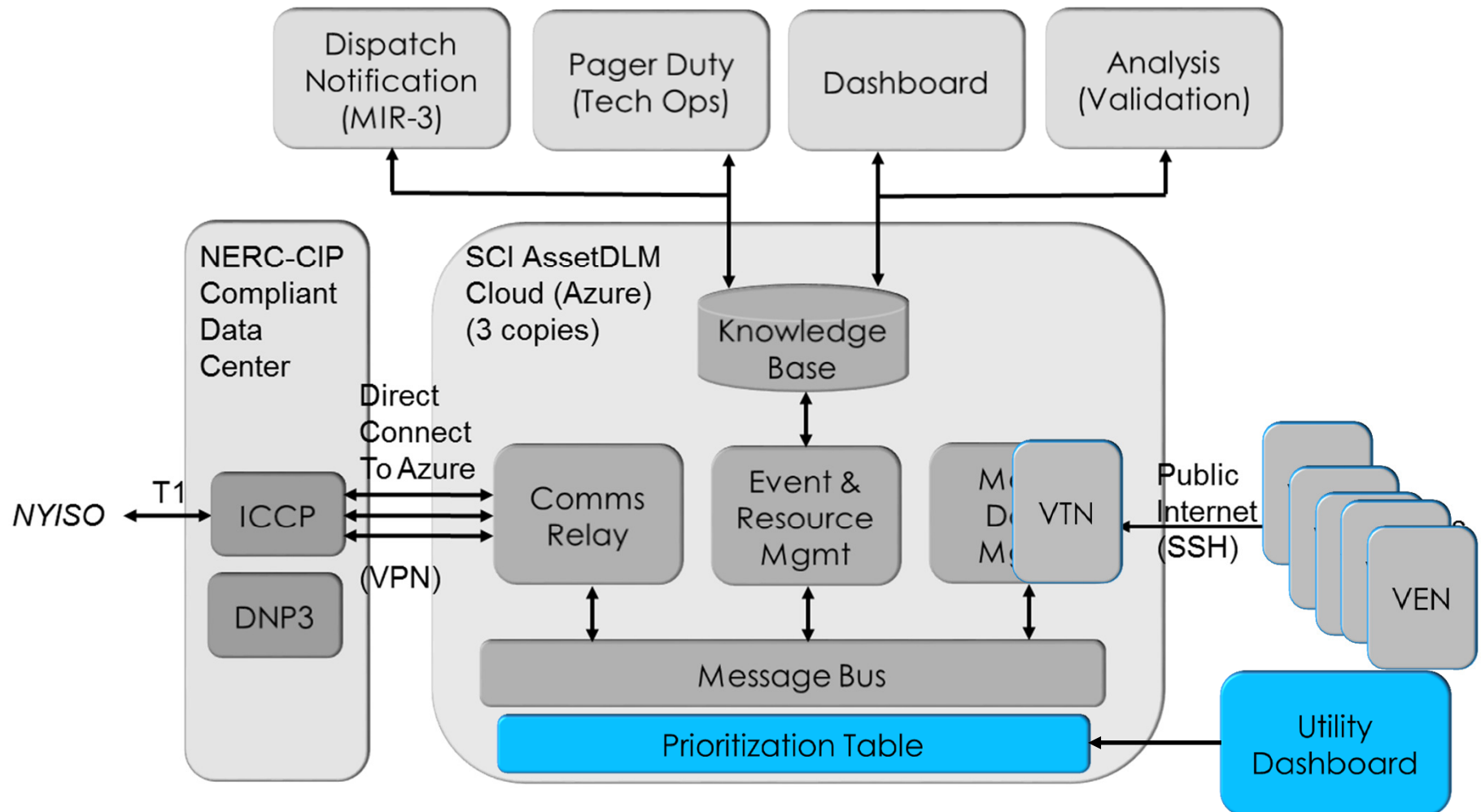
■ DRAS in the Cloud

# Next: Integrate OpenADR 2.0b for Commercial Apps



- VTN added to DRAS; VEN software in the device
- Resources added dynamically

# Future: Prioritize Dispatch via OpenADR 2.0b



- Embed resource prioritization for dispatch
- E.g. Zone3/Feeder5, Zone3/Feeder2