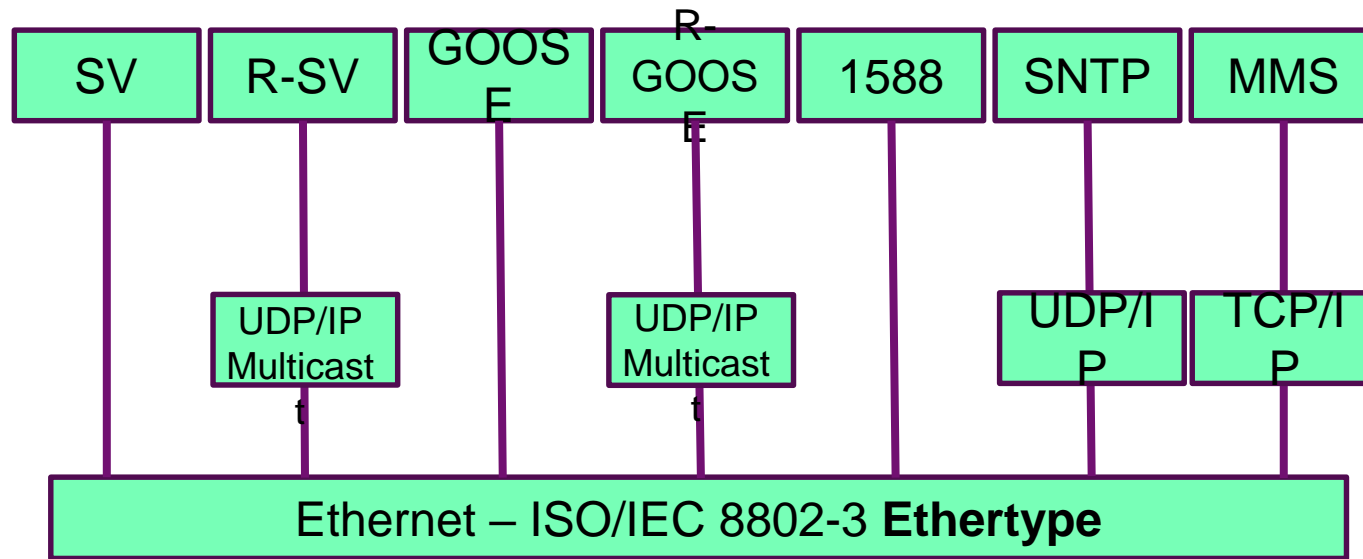


IEC 61850 Solutions via R-GOOSE and R-SV Profiles



Mark Adamiak
GE Grid Automation

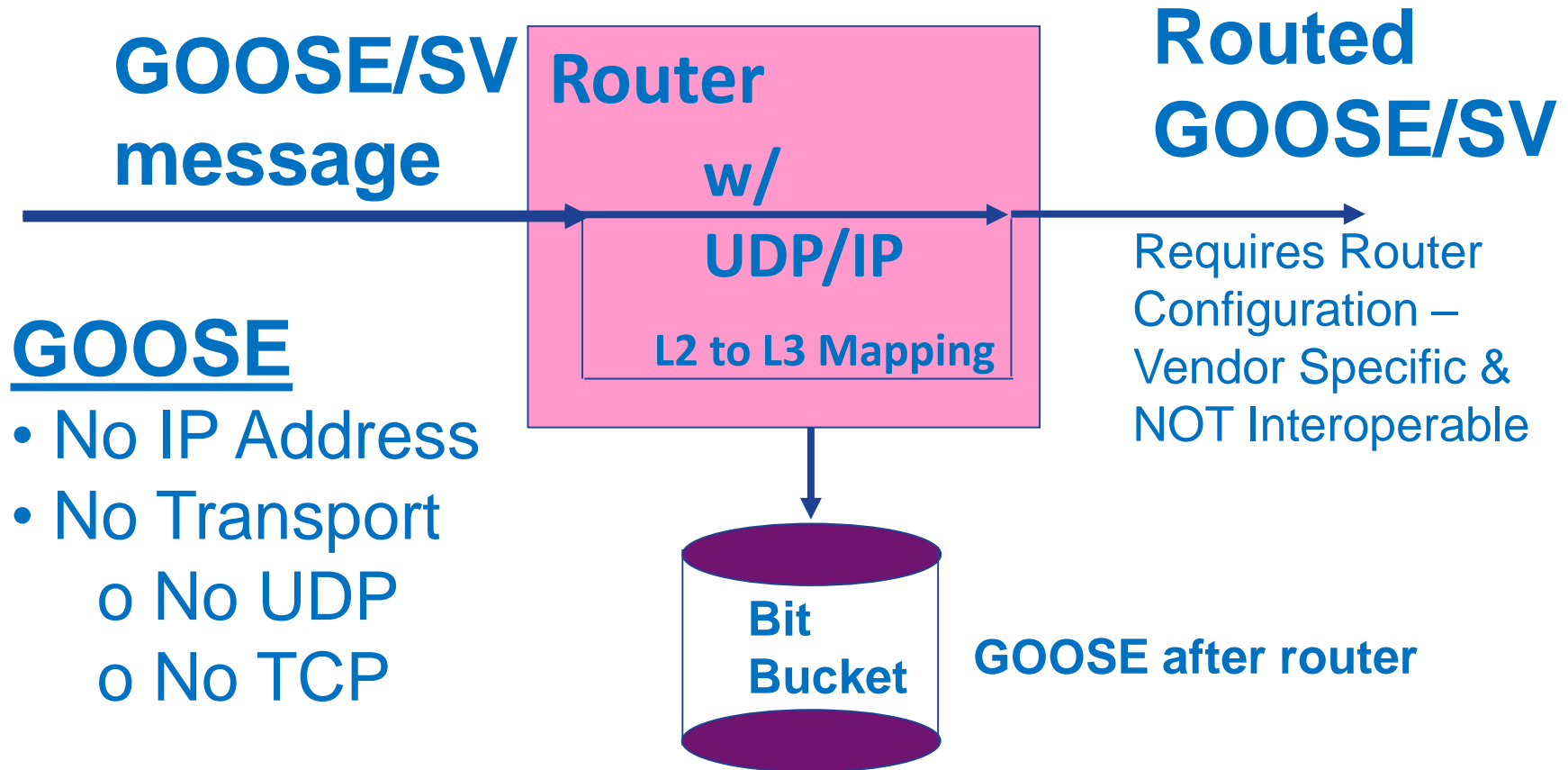


imagination at work

Indoor GOOSE.....



61850 GOOSE at a Router:



Communication NEEDS: Networked Publish/Subscribe Message

- Should be routable
 - Multicast to reach multiple subscribers
- The Integrity of the Publisher/Subscriber should be validated
- Message should be authenticated
- Message should be able to be encrypted
- Should accommodate large message size
- Should manage the Authentication and Encryption key

Committee Approved Technical Report:

IEC 61850: COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

**Part 90-5: Use of IEC 61850 to transmit
synchrophasor information according to
IEEE C37.118**

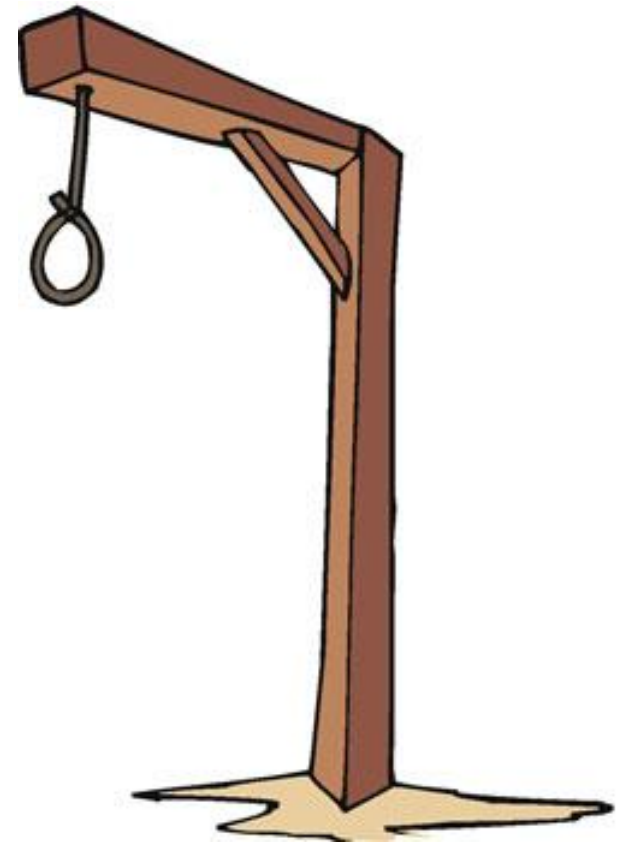
Now - Written into 61850 Ed.

2.1....TBR

Mark's Proposed name for the
Networked GOOSE:

**Networked Object Oriented Substation
Event**

The NOOSE !



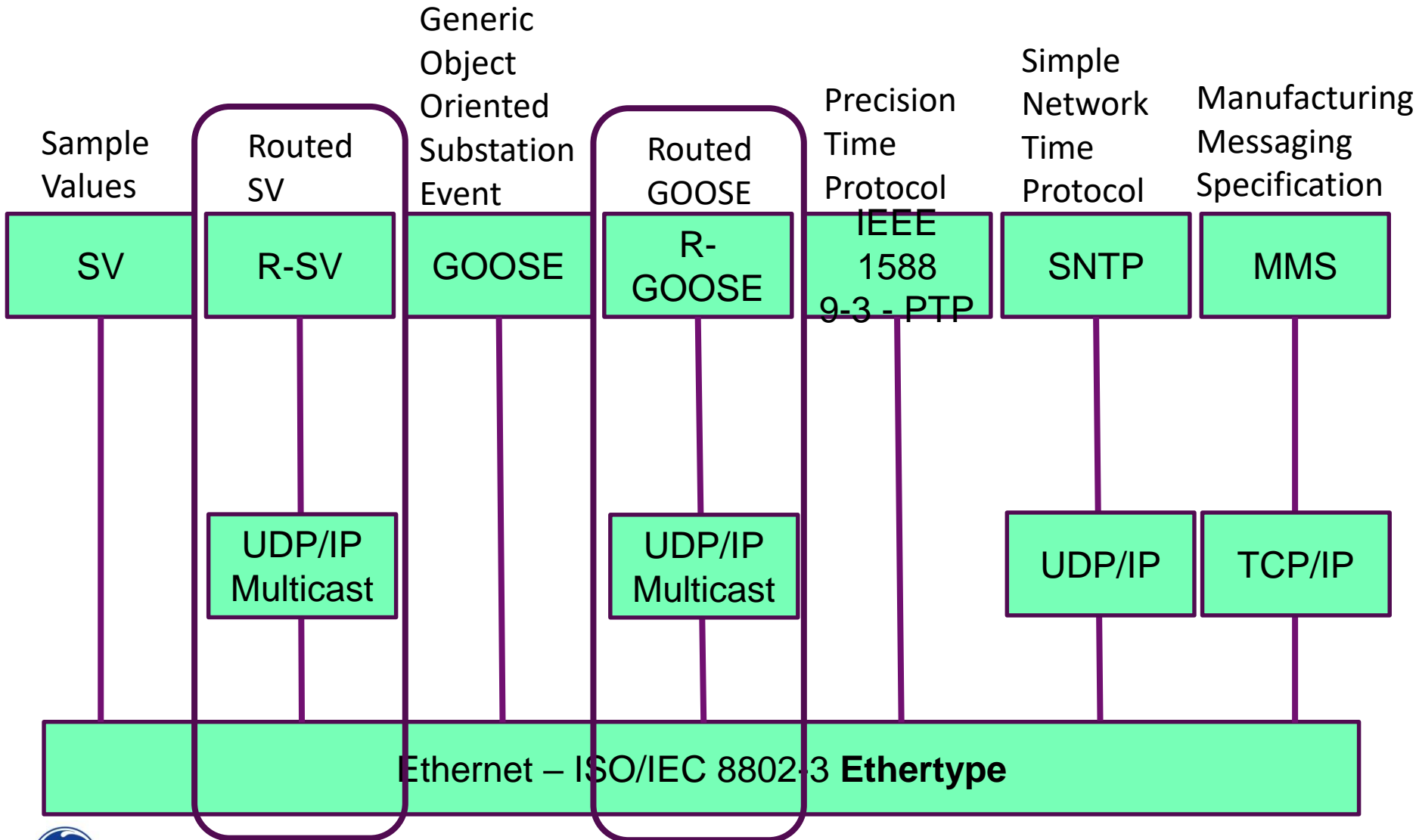
Name Rejected....So we have:

- R-GOOSE (for Routed GOOSE)
 - For routing of Event Data

And

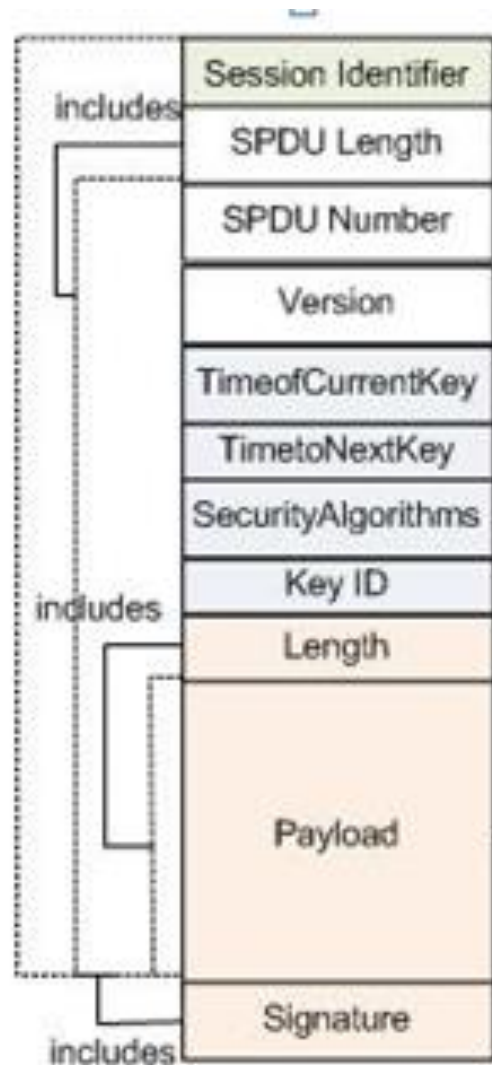
- R-SV (for Routed Sample Values)
 - For routing periodic data

IEC 61850 Profiles



IEC 90-5 Data Model

SPDU:
Session
Protocol
Data
Unit



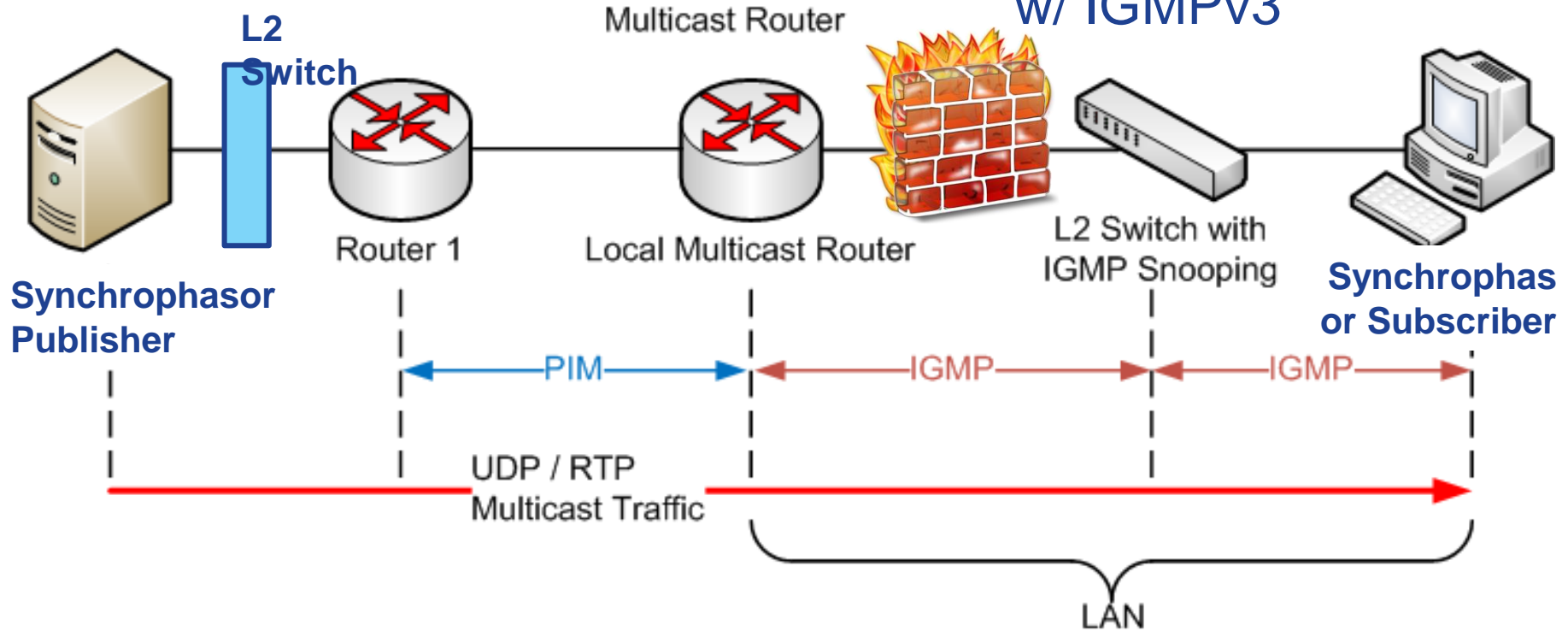
Total Max Size:
65535 bytes

Payload can be
Encrypted

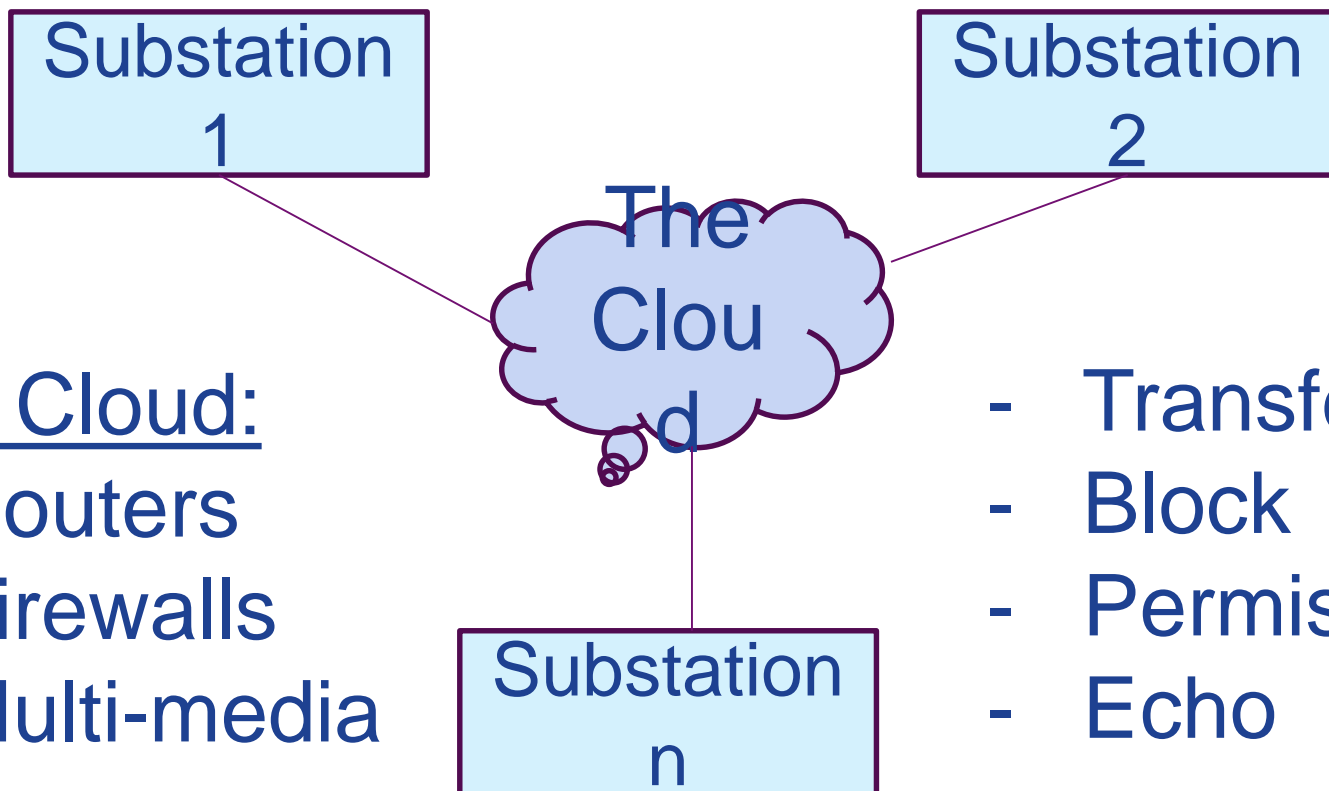
Keyed Hash

Multicast Path Establishment via Internet Gateway Management Protocol – IGMP Ver. 3

Potential Firewall Issues w/ IGMPv3



Application: Substation to Substation



The Cloud:

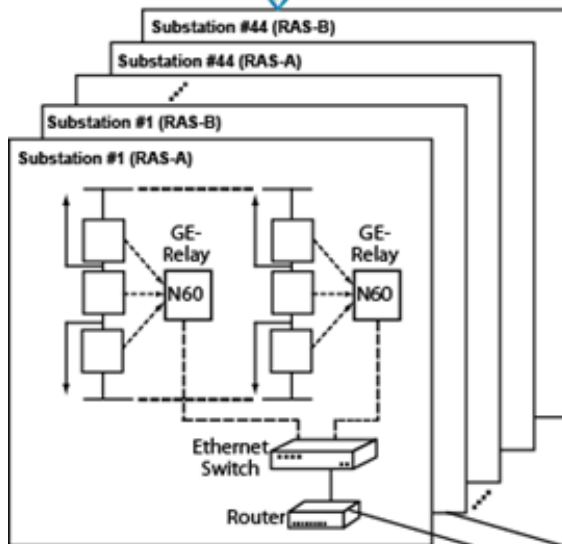
- Routers
- Firewalls
- Multi-media

- Transfer trip
- Block
- Permission
- Echo

New Requirements: Wide Area RAS

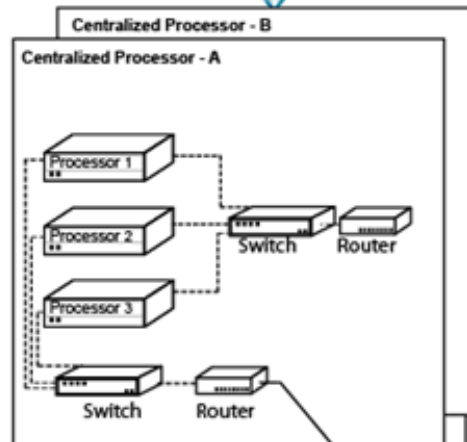
I. Monitoring & Detection

1. Line flow monitoring
2. Line outage detection



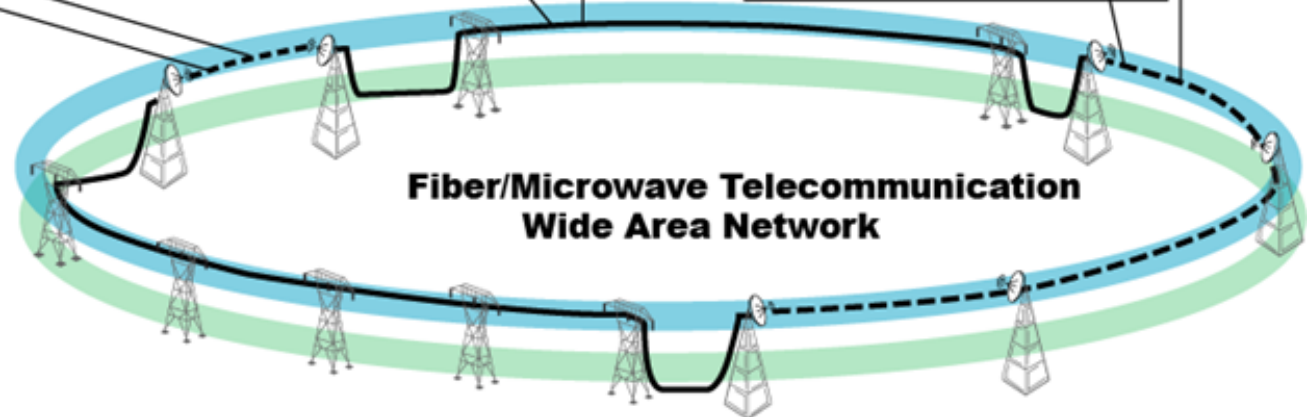
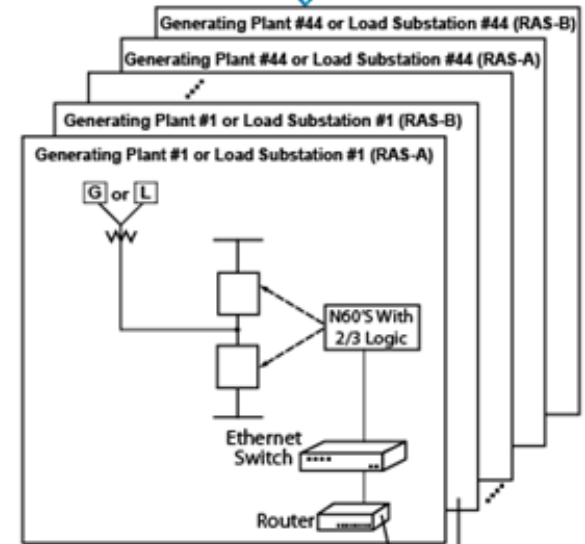
II. RAS Logic Processing

1. Arming Calculations & logic checks
2. Mitigation Level Calculations

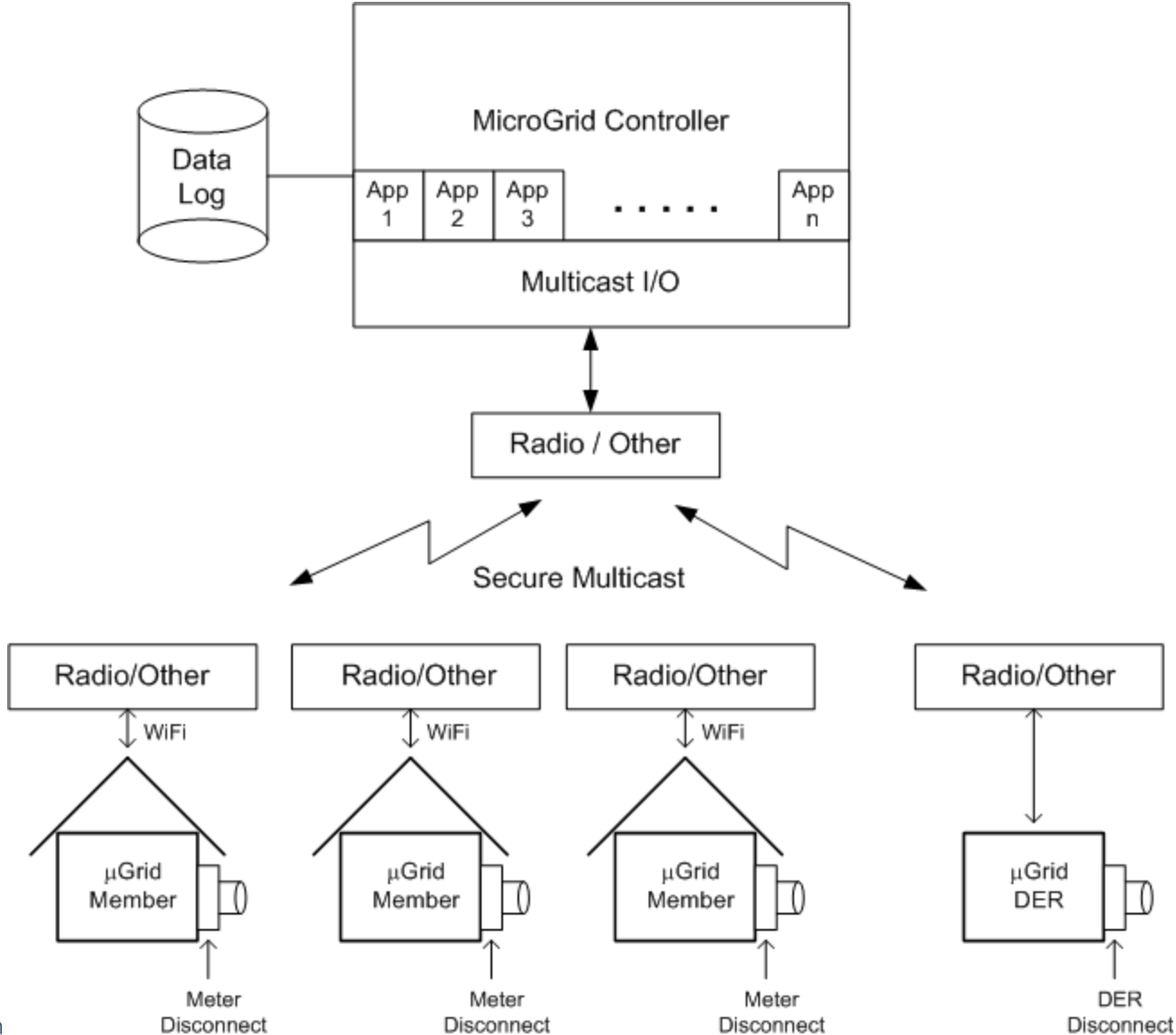


III. Mitigation

1. Generation/load level monitoring
2. Generation tripping/load shedding



MicroGrid Control Reference Architecture



Synchrophasor Use Case

