

# Software Defined Infrastructure in the Academic Research Fleet

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# The Academic Research Fleet as the Large Facility

## Global Class

1. *Thomas G. Thompson* (Univ. of Washington)
2. *Roger Revelle* (Scripps Institute of Oceanography, SIO)
3. *Atlantis* (Woods Hole Oceanographic Institute, WHOI)
4. *Sikuliaq* (Univ. of Alaska Fairbanks)
5. *Marcus G. Langseth* (Lamont-Doherty Earth Observatory)

## Intermediate Class

1. *Kilo Moana* (Univ. of Hawaii)
2. *Oceanus* (Oregon State University)
3. *Endeavor* (University of Rhode Island)
4. *Atlantic Explorer* (Bermuda Institute for Ocean Sciences)
5. *Neil Armstrong* (WHOI)
6. *Sally Ride* (SIO)

## Regional Class

1. *Hugh R. Sharpe* (Univ. Delaware)

## Coastal/Local Class

1. *Robert Gordon Sprout* (SIO)
2. *Pelican* (Louisiana Univ. Marine Consortium)
3. *F.G Walton Smith* (Univ. of Miami)
4. *Savannah* (Skidaway Institute of Oceanography)
5. *Blue Heron* (Univ. of Minnesota Duluth)
6. *Rachel Carson* (Univ. of Washington)



# Shipboard Computing in The Academic Research Fleet

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**CI Problem:** A modernized computing infrastructure is sought to support:

- Basic Services:
  - Network
    - WAN connectivity
    - LAN (shipboard network)
  - State of Health Monitoring
- Scientific Services:
  - Data Acquisition
  - Storage
  - Computing
- Real-Time Services:
  - Pub/Sub
  - Event Driven

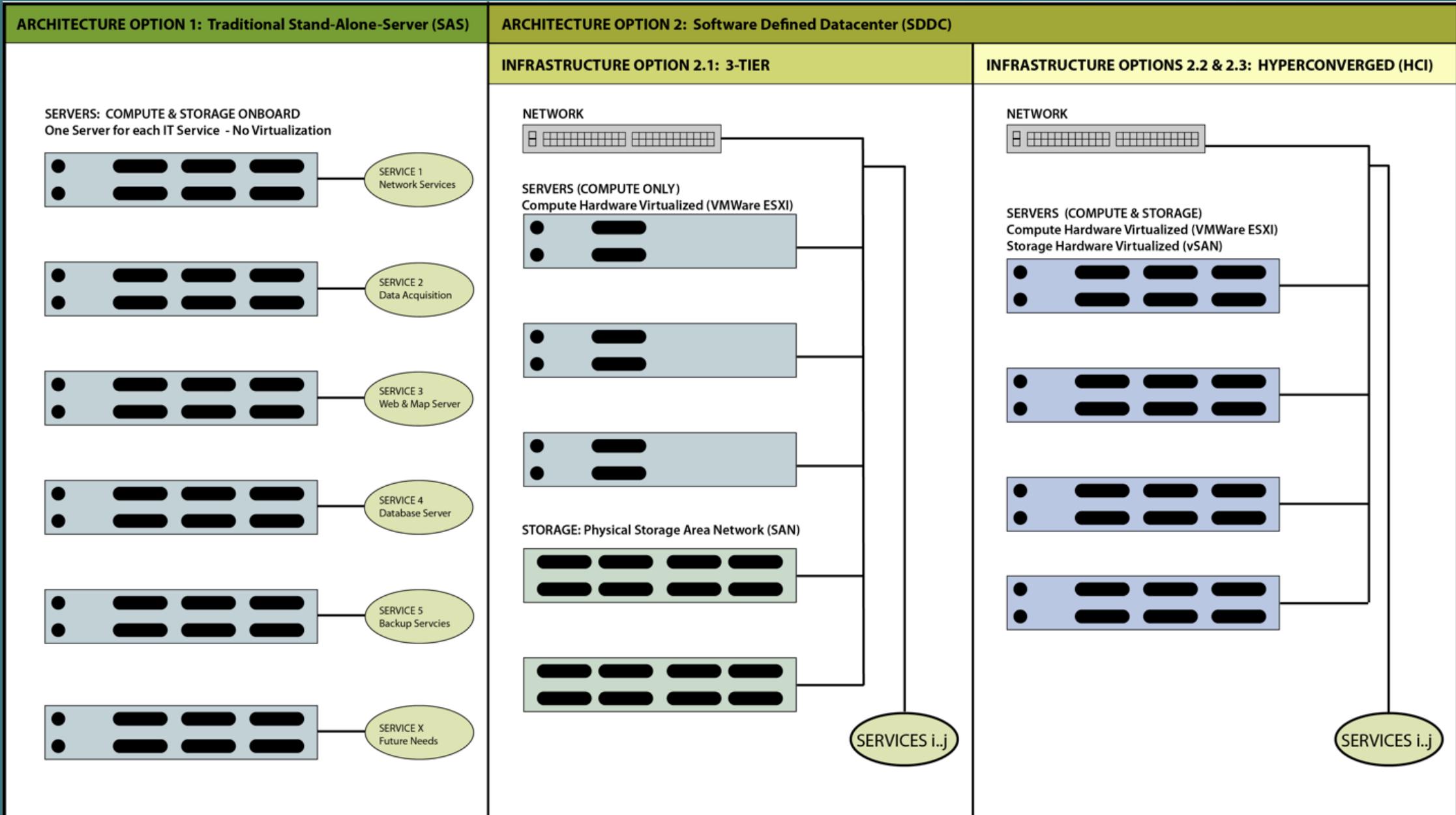
## ***RCRV CI Requirements:***

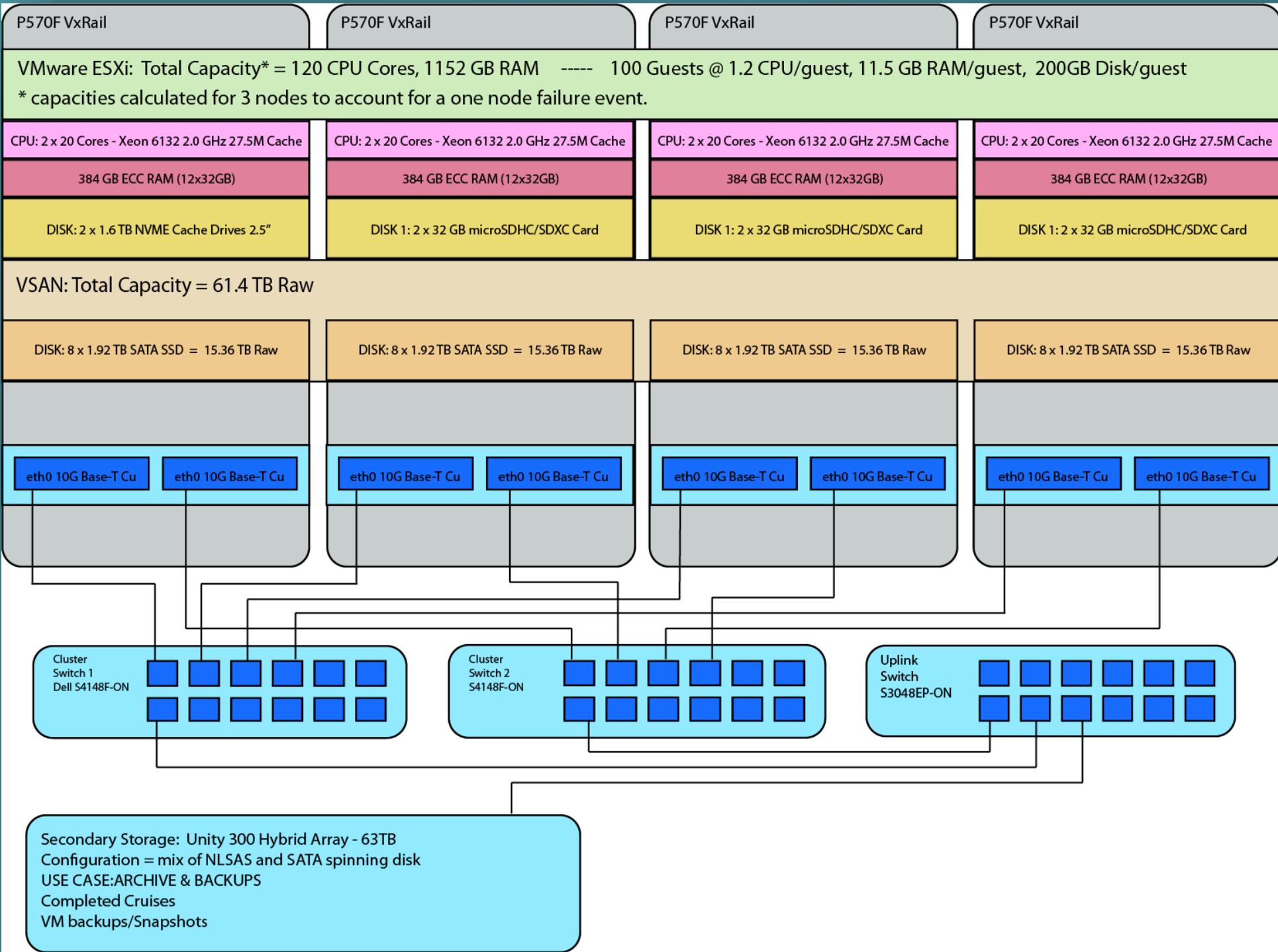
- (1) Must support 40 or more individual & unique IT services
- (2) Must be easily configured for high-availability
- (3) Must include out of band management capabilities
- (4) 10GbE connectivity to the network core
- (5) 20 TB of useable storage
- (6) 75 CPU or CPU equivalents
- (7) 300 GB of RAM

## ***Additional Evaluation Criteria:***

- (1) physical footprint,
- (2) resource footprint,
- (3) compute & storage efficiency,
- (4) technical debt,
- (5) availability,
- (6) ease of management, and
- (7) costs: (CAPEX & OPEX).

# RCRV CI Project: Architecture Options





## Processing Capacity:

- Exceeds 40 Guest Target
  - Room to grow
  - Room to share

**Storage = 60 TB Raw, but..**

Useable space is determined by choices:

- failure tolerance method (RAID-1, 5/6)
  - primary level of failures to tolerate (1, 2, or 3)

## Secondary Network Storage:

- File Storage
  - Backups