

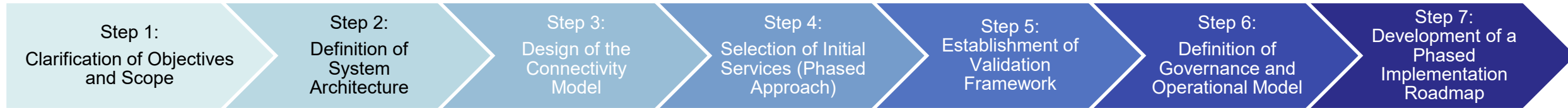
# *APAC SWIM Test Environment – The way forward*

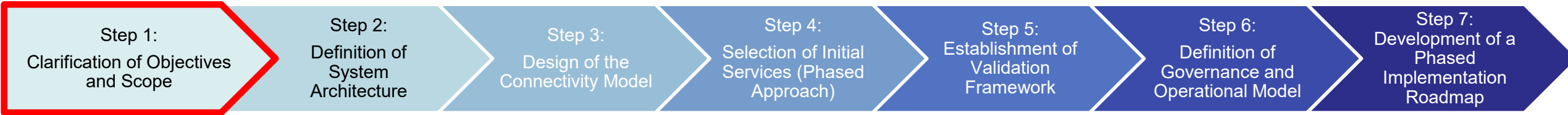
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Option 1: Continuation of the SIPG Test Environment (CRV-based)	Option 2: Internet-Based SWIM Sandbox Environment
<p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Closely replicates the operational (live) environment</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• Participation may be limited due to resource constraints</li> <li>• Connectivity challenges may arise for certain States</li> <li>• Bandwidth testing requires CRV provisioning, incurring additional costs</li> <li>• No established framework for connectivity via the Internet</li> </ul> <p><b>Risks</b></p> <p>None</p>	<p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Facilitates simpler, faster, and more cost-effective connectivity</li> <li>• Supports accelerated implementation, testing, and capacity-building</li> <li>• Enables flexible bandwidth testing</li> <li>• May function as an interim Edge EMS</li> <li>• Particularly suitable for MET information services</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• Does not fully replicate the operational CRV environment</li> <li>• Potential concerns regarding data sensitivity</li> </ul> <p><b>Risks</b></p> <ul style="list-style-type: none"> <li>• May require policy adjustments in certain States</li> <li>• Potential implications in terms of operational costs</li> </ul>

4.31 The Meeting noted that Option 1, the regional SWIM testing environment over CRV, is aligned with the current SIPG test setting. Maintaining this approach during the initial phase of APAC SWIM implementation may therefore be advantageous. However, as APAC SWIM evolves with operational SWIM traffic carried over CRV and the demand for service validation increases, constraints on CRV capacity may arise. On the other hand, a regional SWIM testing environment over the Internet may accommodate a wider group of information consumers and support testing of bandwidth-intensive information services (e.g. MET) in a regional environment. Accordingly, it was recognised that there may be a future need to transition from the regional SWIM testing environment from CRV to the Internet. The Meeting therefore requested Japan to further explore feasible approaches for transitioning the testing environment from CRV-based connectivity to Internet-based connectivity **ACTION ITEM 11-16** It was further suggested that the study considers the associated technical work and costs required for such transition and the long-term maintenance of the environment. In this regard, the CRV network model, which is based on cost-sharing among APAC member States, may serve as a useful reference.

# Proposed Steps for Further Concretization

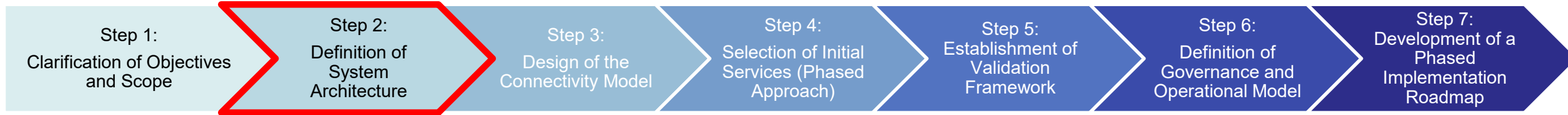




To ensure effective implementation, the objectives and scope of the test environment should first be clearly defined.

***Key elements to be determined include:***

- ✓ Target stakeholders (information service providers and consumers)
- ✓ Purpose of the environment, such as:
  - Connectivity testing?
  - Data exchange validation?
  - Quality of Service (QoS) evaluation?
  - Development and testing (sandbox usage)
- ✓ Phased approach of validation activities, for example:
  - Phase 1: Connectivity validation
  - Phase 2: Data exchange validation
  - Phase 3: End-to-end and QoS validation



A basic architecture for the Internet-based test environment should be defined.

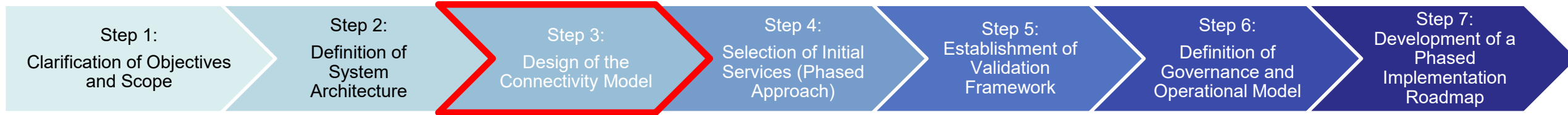
***Minimum components may include:***

- ✓ Access platform (e.g. cloud-based environment or VPN over Internet)
- ✓ Message exchange mechanisms (aligned with SWIM standards, e.g. Request/Reply, Pub/Sub)
- ✓ Provision of test or simulated data

***Roles and responsibilities should also be clarified:***

- ✓ Hosting entity (e.g. volunteer State or regional support mechanism)
- ✓ Participating users (ANSPs, airlines, industry stakeholders)

# Step 3: Design of the Connectivity Model



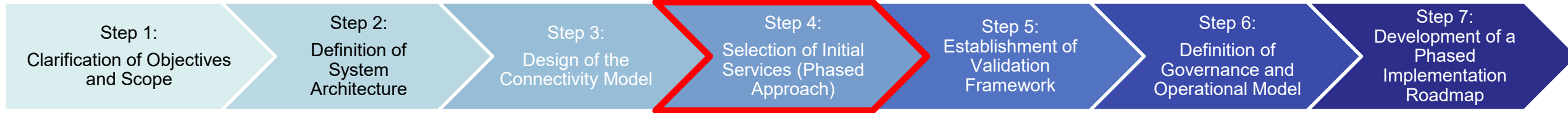
A clear connectivity model is essential for practical implementation.

***Key aspects include:***

- ✓ Authentication mechanisms (e.g. PKI)
- ✓ Access control procedures (e.g. registration and approval process)
- ✓ Communication method (Internet-based access)

This approach should enable simplified and flexible participation.

# Step 4: Selection of Initial Services (Phased Approach)



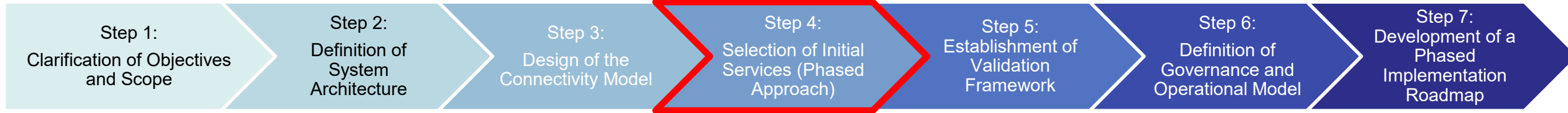
The scope of services should be introduced in a phased manner, starting with a limited set.

## ***Recommended approach:***

- ✓ Begin with immediate services with low data sensitivity, such as meteorological services
- ✓ Gradually expand to additional services based on readiness and requirements

This approach helps mitigate risks related to data sensitivity and system complexity.

# Step 4: Selection of Initial Services (Phased Approach)



## Prioritization of Priority 1 Services for Internet-based SWIM Sandbox (Japan Proposal)

*Immediate services provide a baseline, but phased introduction based on data sensitivity is essential.*

High Sensitivity



Low

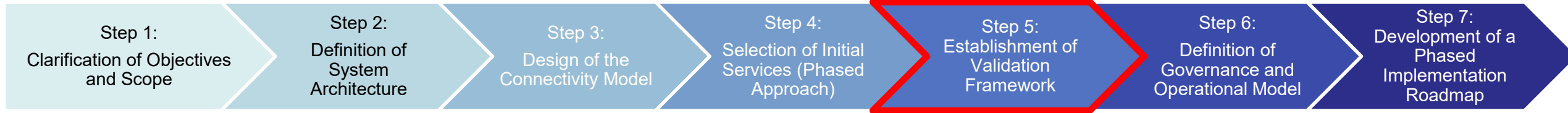
Phase 1: Initial Sandbox  
METAR, TAF, SIGMET  
VA, TC Advisory  
Space Weather, WAFC SIGWX

Phase 3: Operational Validation  
FF-ICE Filing  
ATFM/CDM Integration  
Flight-specific ATFM

Phase 2: Advanced Testing  
GUF1  
FF-ICE Data Request  
FF-ICE Notification

Implementation Readiness →

# Step 5: Establishment of Validation Framework

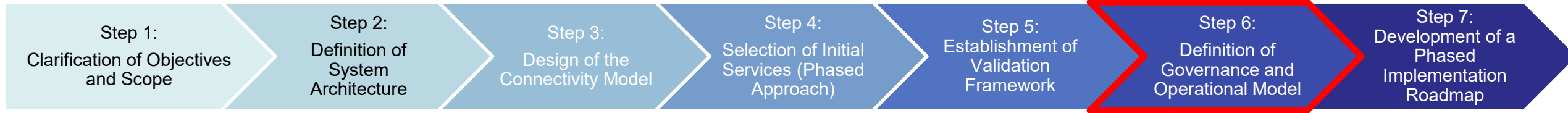


A common validation framework should be developed to ensure consistent evaluation.

***Potential evaluation metrics include:***

- ✓ SWIM TI functions
- ✓ QoS of Information Services
- ✓ Operational or business rules

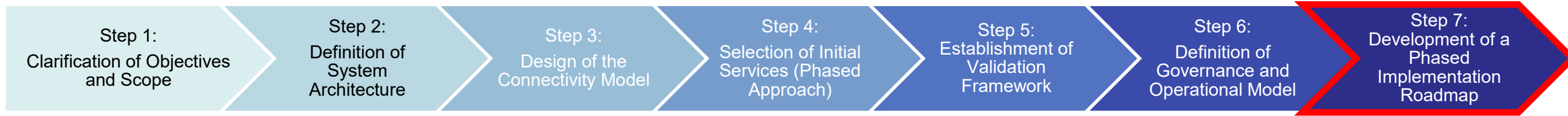
Such metrics will support objective assessment of service performance.



A governance framework should be established to support sustainable operation.

***Key considerations include:***

- ✓ Cost-sharing arrangements
- ✓ Participation rules and procedures
- ✓ Data usage policies and restrictions
- ✓ Security and compliance requirements

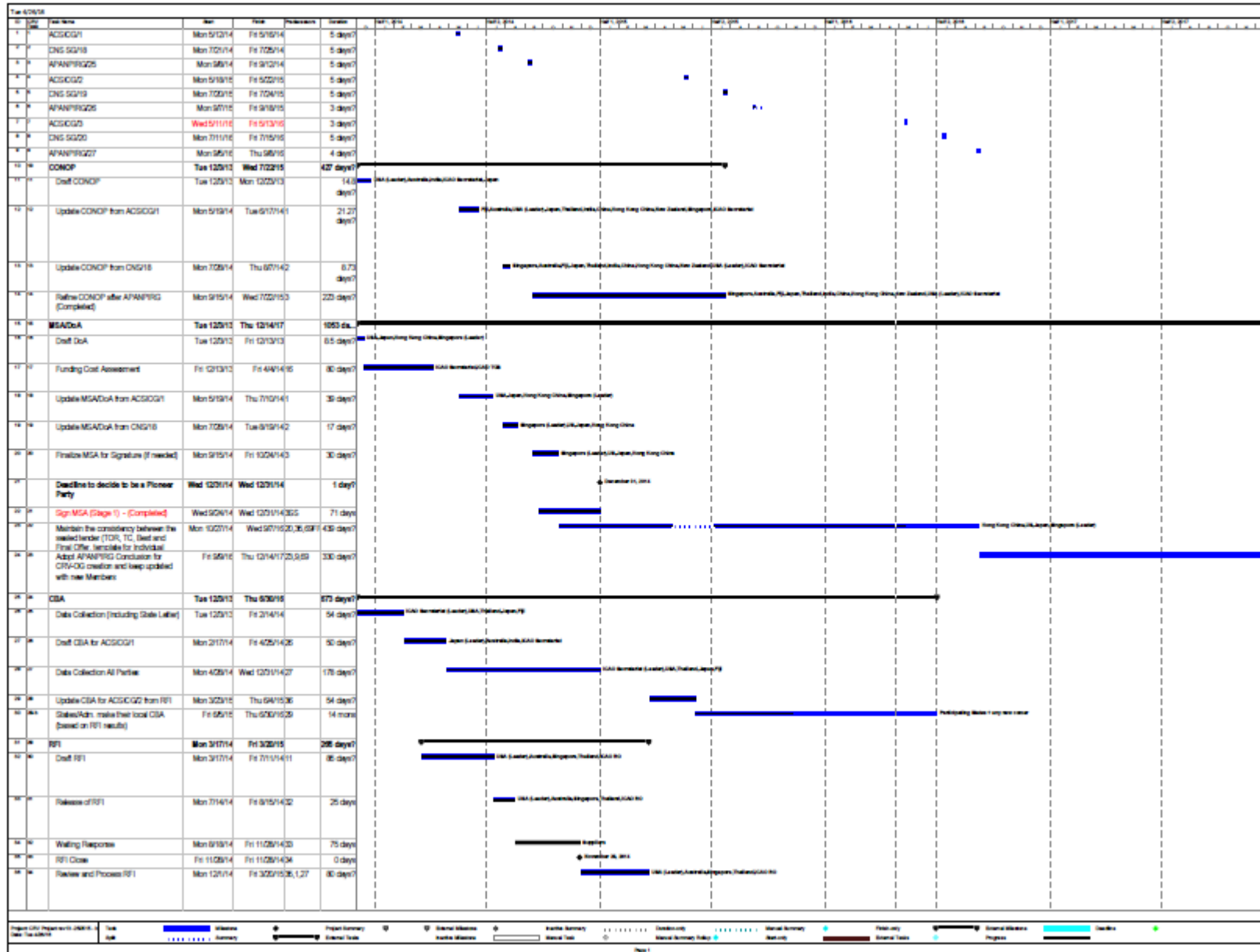


A roadmap should be defined to guide the progressive implementation of the test environment.

***Illustrative phases may include:***

- ✓ Phase 1 (Initial stage):
  - Establishment of sandbox environment
  - Deployment of limited, low-risk services
  
- ✓ Phase 2 (Expansion stage):
  - Participation of multiple States
  - Initial QoS measurements
  
- ✓ Phase 3 (Advanced stage):
  - Integration with operational environments (e.g. CRV-based infrastructure)
  - End-to-end validation

# In case of CRV implementation (CRV TF/5 – WP/2 Appendix D)



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