



ORSNET technical note

Oceania Regional Seismic NETWORK



1. ORSNET General Specifications

Purpose: The ORSNET system will be developed to:

- Provide an efficient local Earthquake automatic System for National Observatories
- Provide an regional (South West Pacific area) common tool for earthquake and tsunami early warning system

The early stage of the ORSNET deployment will focus on countries along the South West Pacific subduction trench:

- Tonga
- Fiji
- Samoa
- Vanuatu
- Solomon Islands
- Papua New Guinea
- New Caledonia

Note: The main objective of this regional network is not to create or develop National Seismic Network but to mutualize and integrate, within Oceania, earthquakes and tsunami early warning tools and software. Mainly in order to share resources and mutual support

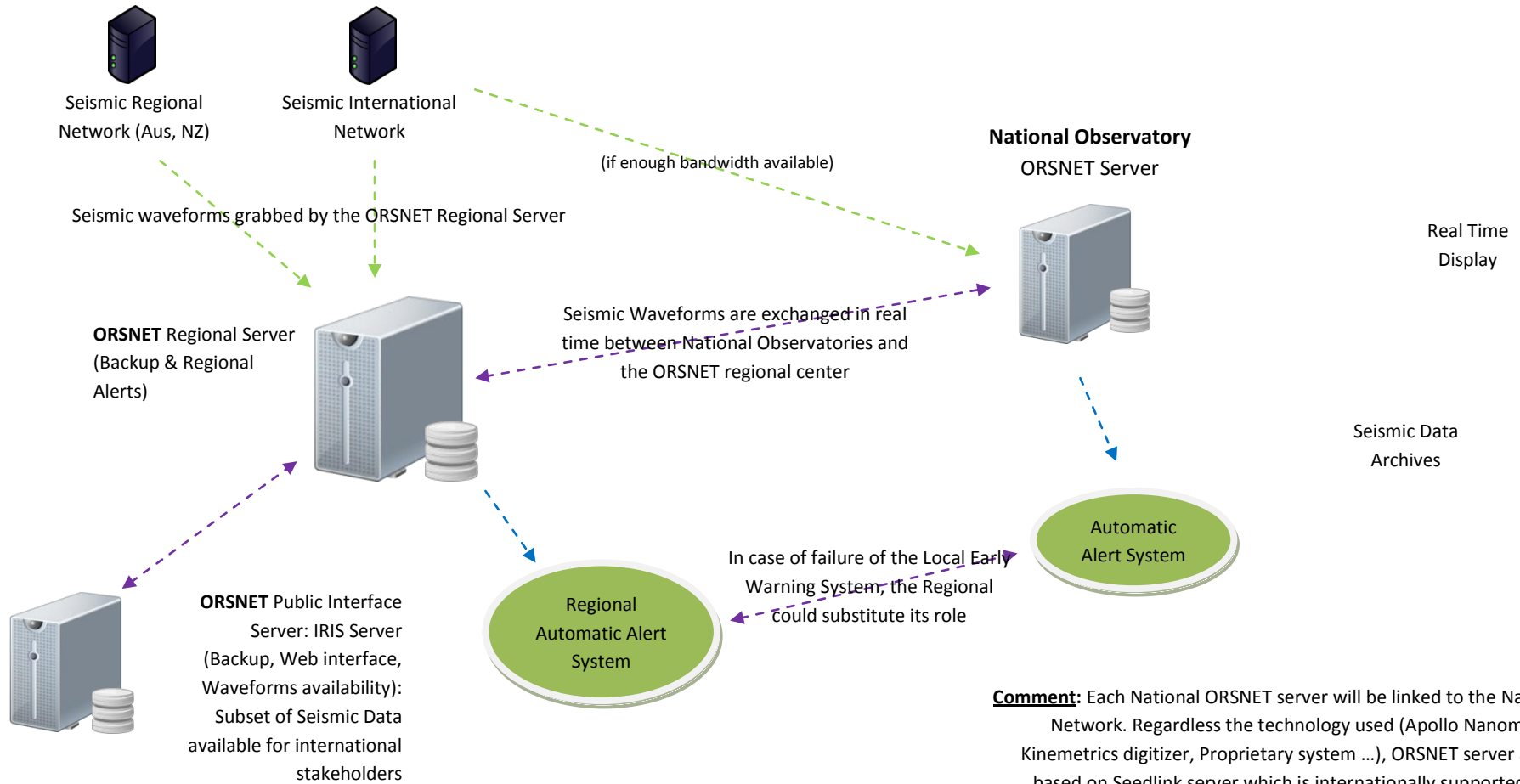
Technical note: The ORSNET software kit is mainly based on Seiscomp3, free distributed software developed by the GEOFON Program at Helmholtz Centre Potsdam, GFZ German Research Centre for Geosciences and gempa GmbH and used by most of National Tsunami Warning Center around the globe.

This software was customized as a kit to take into account Oceania observatories difficulties (e.g. slow internet bandwidth, lack of resources and need of fast dissemination).

Objectives: This system is focused on:

- standardization of a regional earthquake monitoring system, connected to each National Seismic Network
- an efficient automatic detection software with user friendly display, largely used by international observatories
- an automatic alert system through email, SMS or website
- a real merged and integrated regional network with common procedures.

2. ORSNET General Architecture



Comment: Each National ORSNET server will be linked to the National Seismic Network. Regardless the technology used (Apollo Nanometrics system, Kinometrics digitizer, Proprietary system ...), ORSNET server architecture is based on Seedlink server which is internationally supported and could be updated if some specific requirements are needed

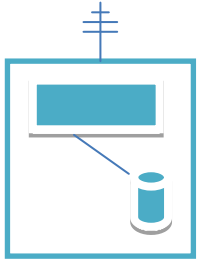
ORSNET Overall Design

National Seismic Data Center

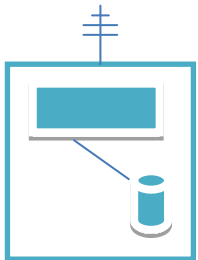
National ORSNET Server

At this stage of the project, **ORSNET** implementation should focus SWP Countries which already have a NSDC (i.e. Fiji, Tonga, New Caledonia, Vanuatu, Solomon Islands, PNG and Samoa)

Virtual Interface



Seismic Station



Seismic Station



Network



National Data Center

Seismic acquisition system and database (e.g. Nanometrics Atlas, Guralp Stream Server, Kinometrics Etna or Proprietary acquisition system)

Linked with Seedlink server by specific plugin connection



ORSNET Regional Server



Seismic International Network

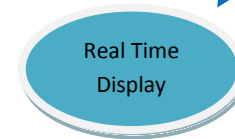
(if enough bandwidth available)



ORSNET Main Server
National Seedlink Server
Seismic Archive
Display Management



Seismic Data Archives



Real Time Display

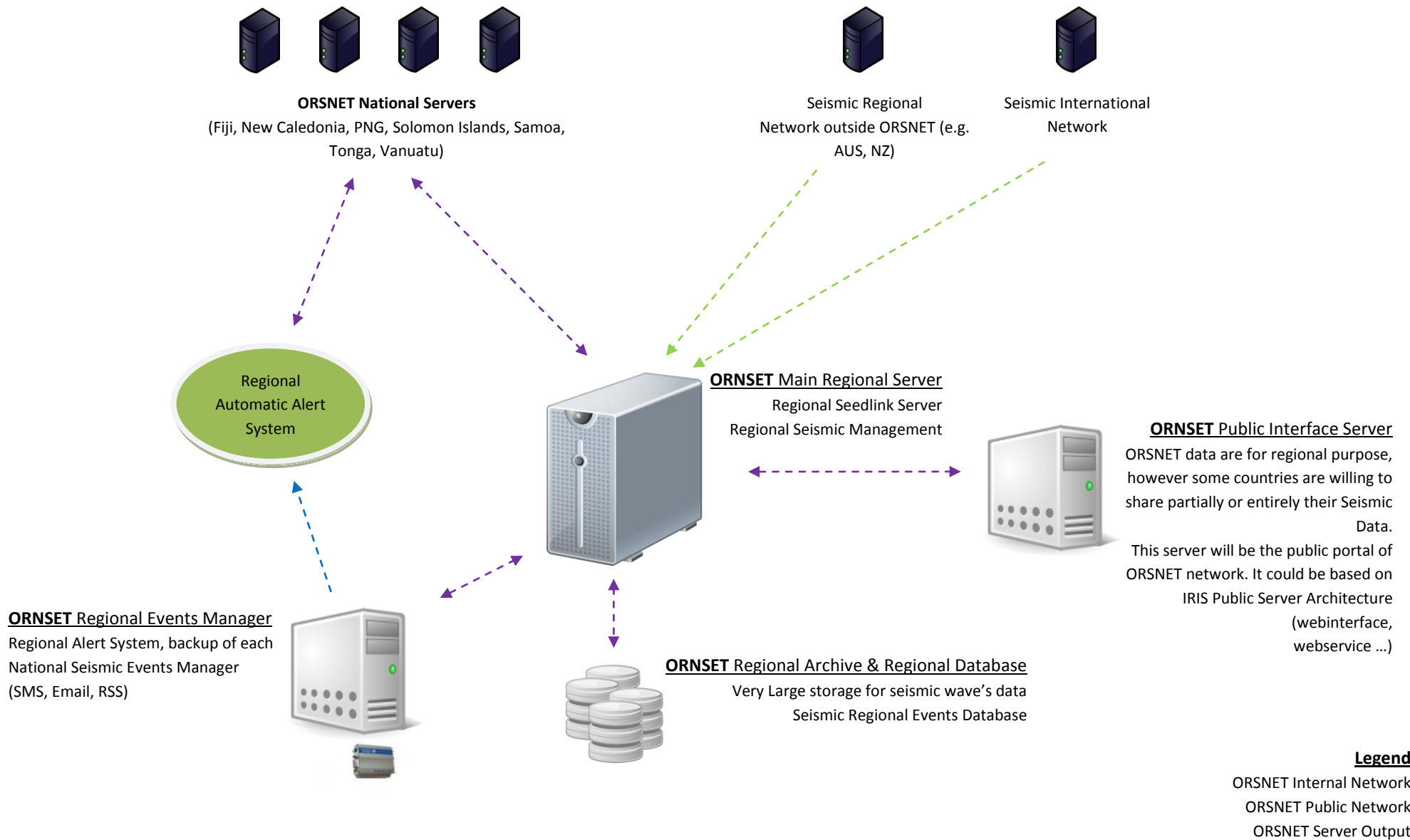


ORSNET Events Manager
Early Determination
Events Management
Alert Management
(SMS, Email, RSS)



Automatic Alert System

ORSNET National Server General Design



ORSNET Regional Server General Design

3. Overall planning for ORSNET server deployment within National Observatories

The deployment of the ORSNET server within all Oceania National Observatories will depend of each national context and capacities. However, most of the regional needs regarding Tsunami and Earthquake mitigation are common:

1. Display of information within the National Observatories and among the disaster management stakeholders
2. Reliable alert system
3. Accurate Earthquake information

The objectives of the ORSNET deployment must target the success of these National needs.

A. Phase 1: Discussion on the current capabilities in term of earthquakes and tsunami mitigation:

1. Presentation of ORSNET to the National disaster and emergency response stakeholders
2. National Seismic Network Assessment (e.g. national seismic network, real-time availability)
3. National Data Center Capability (e.g. server availability, internet access, power backup)
4. National Observatories Capacity (i.e. human resources)

B. Phase 2: ORSNET Server installation

1. Automatic Seismic Events Detection software installation and configuration (Seiscomp3)
2. Configuration of the National Seismic Network within the ORSNET server (e.g. creation of seismic dataless files)
3. Integration of the others ORSNET into the National ORSNET Server
4. Installation, configuration and test of the ORSNET Automatic Alert System (SMS, email and internet broadcast, depending of the country capability regarding these technologies)
5. Integration of the National ORSNET server into the regional ORSNET server

C. Phase 3: Validation, training and documentation

1. Validation of each National ORSNET implementation by an expert in seismology
2. Training on the ORSNET server maintenance duties
3. Training on the use of the information coming from ORSNET server
4. Documentation (Troubleshooting, F.A.Q., regional contact)

D. Phase 4: Discussion on earthquake and tsunami mitigation. Globalizing the disaster and emergency response

1. Discussion with the National authorities (NDMO, observatories, government representatives) about the use of ORSNET for National Disaster Response
2. Discussion about Regional Alert System