Portuguese **Distributed** **Computing** Infrastructure

Housing and networking planning complete (Mi7.1)

Execution report

State:	**FINAL**
Dissemination:	**PRIVATE**
Authors:	**João Pagaime (FCCN)**
URL:	**http://www.incd.pt**

Date	Author	Comments
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Introduction

Housing and networking is an activity that comprises the provision of network and datacenter services, which are essential for communication and housing of the computer equipment that will supports the INCD services. The activity will last the duration of the project, but will have a greater impact during the services implementation or upgrade periods, such as during the acquisition and installation of new computer equipment.

The network interconnection between INCD centres and the user access will be performed through the National Research and Education Network (RCTS), which delivers networking services to schools, universities, polytechnics, and research institutes. RCTS is an advanced communication platform that has specific capabilities to meet the demanding needs of the scientific community. In the present case of INCD the specific features mainly relate to the high bandwidth, latency, high reliability and security required to interconnect the computing and data services both nationally and internationally with other similar infrastructures in Europe and elsewhere. The Network Science, Technology and Society (RCTs) supports both layer 2 and layer 3 network connections. RCTS provides international connectivity through the Géant European backbone and using cross-border fibre to Spain. INCD will exploit all types of connectivity for datacenter interconnect, user access and international connectivity.

The INCD computer equipment will require excellent housing conditions, in a controlled environment, with physical access control to the spaces, high power stability, and cooling. The data center service availability should be at or above a 4 hour break every 24 months of continuous operation. Availability is measured by continuity of supply of regulated electricity and cooling air to computer equipment.

The INCD members have built sala-grid/NCG the largest and best datacenter in the academic and research sector in the country. It already houses services from LNEC, LIP and the Portuguese Tier-2 for the WLCG, as well as many other services delivered to the academic community by the NREN, and also from public entities. The datacenter will be improved to house the upgrade capacity and meet the needs of the new services. The activity will also include the selection and improvement of other datacenter spaces in accordance with the above characteristics.

This report is for the projects milestone **Mi7.1- Housing and networking planning complete**, and provides evidence that this task/milestone has been done and is complete.

Requirements

Housing - nodes

- Lisboa 4 racks
- Norte 6 racks
- Centro 2 racks

Network

- Each node needs to be interconnected with high speed Ethernet channels. Preferably, with layer-2 connectivity.
- A subset of nodes will be equipped with low latency interconnect (e.g. Infiniband)
- RCTS will provide layer-3 global connectivity.
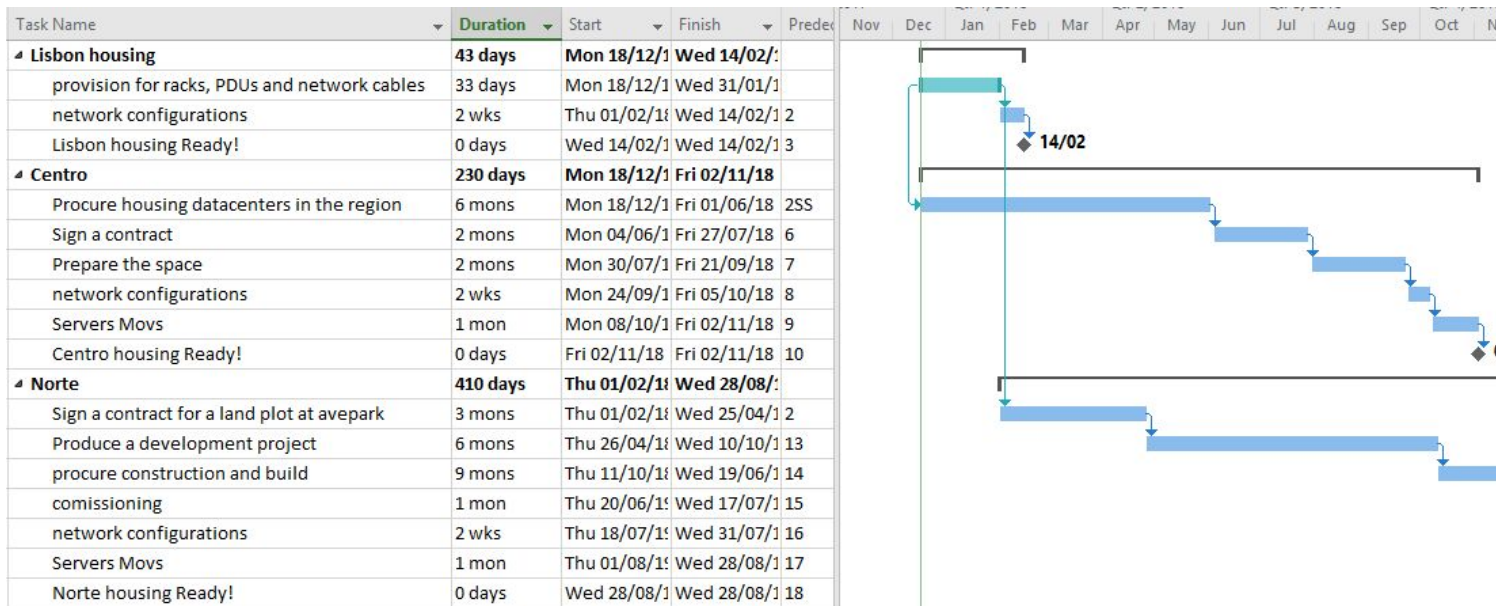
Planning

This report includes:

- Graphical representation (Gantt chart)
- Textual description to the Gantt chart
- Table with task detailed information on tasks

Graphical representation (Gantt chart):

Task Name	Duration	Start	Finish	Predec
⊿ **Lisbon housing**	**43 days**	**Mon 18/12/1**	**Wed 14/02/:**	
provision for racks, PDUs and network cables	33 days	Mon 18/12/1	Wed 31/01/1	
network configurations	2 wks	Thu 01/02/18	Wed 14/02/1	2
Lisbon housing Ready!	0 days	Wed 14/02/1	Wed 14/02/1	3
⊿ **Centro**	**230 days**	**Mon 18/12/1**	**Fri 02/11/18**	
Procure housing datacenters in the region	6 mons	Mon 18/12/1	Fri 01/06/18	2SS
Sign a contract	2 mons	Mon 04/06/1	Fri 27/07/18	6
Prepare the space	2 mons	Mon 30/07/1	Fri 21/09/18	7
network configurations	2 wks	Mon 24/09/1	Fri 05/10/18	8
Servers Movs	1 mon	Mon 08/10/1	Fri 02/11/18	9
Centro housing Ready!	0 days	Fri 02/11/18	Fri 02/11/18	10
⊿ **Norte**	**410 days**	**Thu 01/02/18**	**Wed 28/08/:**	
Sign a contract for a land plot at avepark	3 mons	Thu 01/02/18	Wed 25/04/1	2
Produce a development project	6 mons	Thu 26/04/18	Wed 10/10/1	13
procure construction and build	9 mons	Thu 11/10/18	Wed 19/06/1	14
comissioning	1 mon	Thu 20/06/19	Wed 17/07/1	15
network configurations	2 wks	Thu 18/07/19	Wed 31/07/1	16
Servers Movs	1 mon	Thu 01/08/19	Wed 28/08/1	17
Norte housing Ready!	0 days	Wed 28/08/1	Wed 28/08/1	18

Textual description:

- The Lisbon node is the simplest case, since there is already a datacenter in place, some reconfiguration and changes will be required to receive new racks.
- The Centro node still needs a procurement phase. A promising location is next to the Navigator HPC cluster (https://www.uc.pt/lca/ClusterResources/Navigator); but this option need to be further analyzed.
- The Norte node is expected to wait for a definite datacenter build. The most promising site is at Avepark, having been made auscultation activities with Avepark's managing directors. A signed proposal is expected to be made soon by FCT to Avepark's managing directors.

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Satellite representation of Avepark (coordinates 41.5092557,-8.3365426):
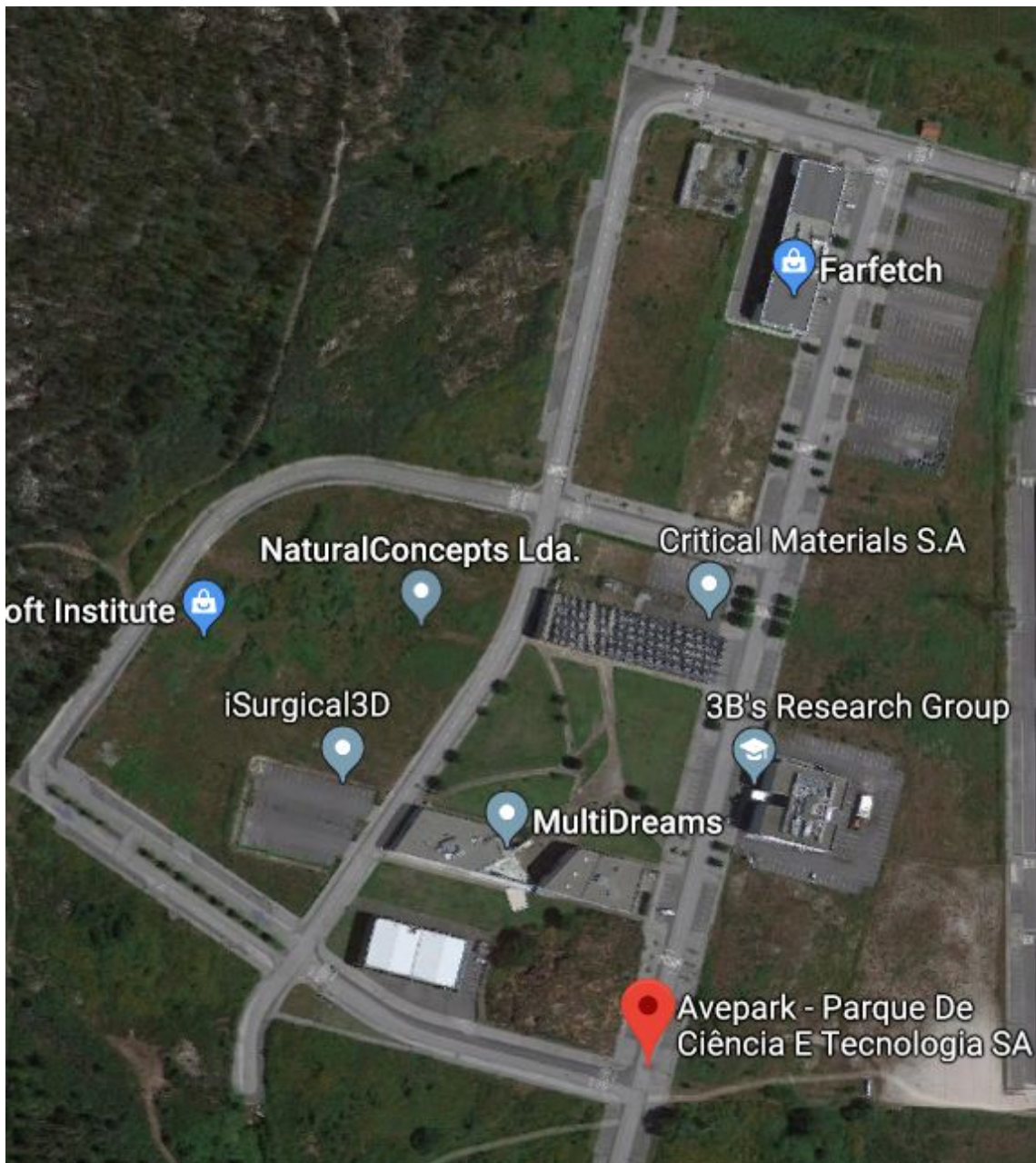
Table with task detailed information:

Task Name	Duration	Start	Finish	Predecessors
Lisbon housing	**43 days**	**Mon 18/12/17**	**Wed 14/02/18**	
provision for racks, PDUs and network cables	33 days	Mon 18/12/17	Wed 31/01/18	

network configurations	2 wks	Thu 01/02/18	Wed 14/02/18	2
Lisbon housing Ready!	0 days	Wed 14/02/18	Wed 14/02/18	3
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