




National
Center
for
High-performance
Computing

Grid Applications and Human Network in SARS Combat

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國家高速網路與計算中心



“Bandwidth” and “degree of connectivity”
are the new measures of power ...

- Three distinguishing factors to harness power
 - Culture to exploit & share knowledge
 - Competitive setting that embraces change
 - Ability to partner

Thomas Friedman, New York Times, P.11 11/Apr/1998

--courtesy of Chris Buja

國家高速網路與計算中心

Twain Advanced Research and Education Network



Network Steering and Deployment committees

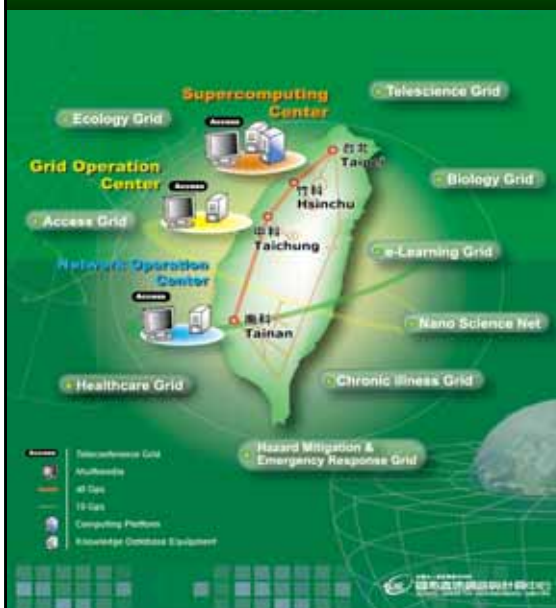
Backbone 40Gbps
Regional Network 10Gbps
Campus Network 1Gbps

Technologies & Applications

- Multimedia
- e-learning
- Multicast
- MPLS/VPN
- IPv6
- Measurement

International Innovation and Collaborations

Knowledge Innovation National Grid



KING Steering and Deployment committees

- Supercomputing Center
- Grid Operation Center
- Network Operation Center (NOC)

Grid applications

- ECO Grid
- Asthma Grid
- SARS Grid
- Access Grid
- Biology Grid
- Hazard Mitigation & Emergency Response Grid
- e-learning Grid

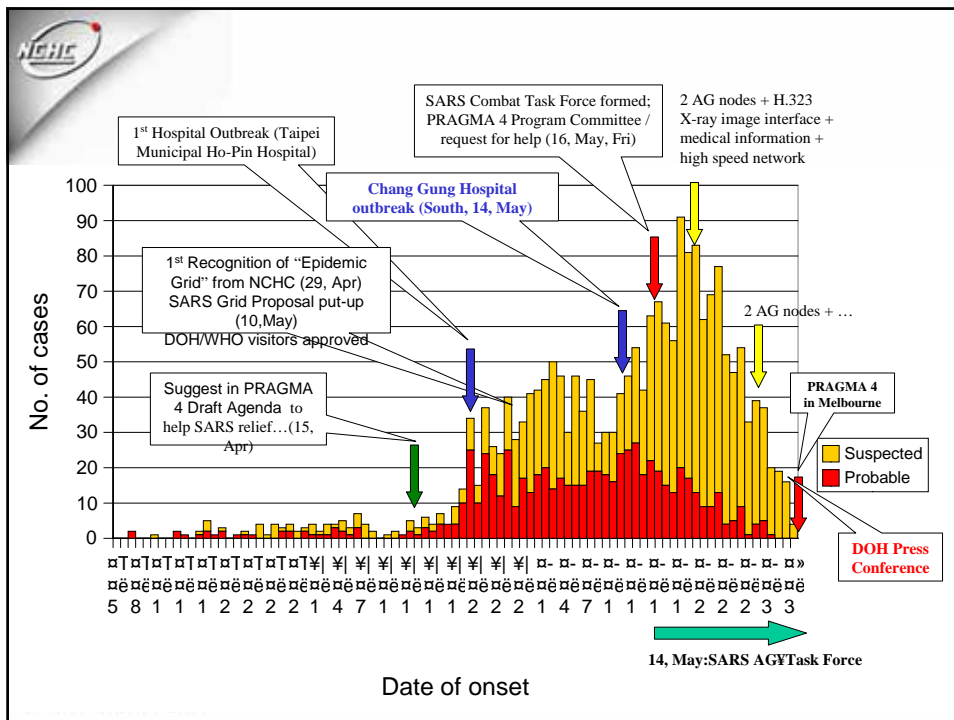
International Innovation and Collaboration



The Disease

- The period of incubation for the coronavirus of SARS is 3-7 days. 10 days quarantine is the key to contain the virus.
- Transmission through physical contact or breathing in flying particles of the saliva or phlegm of a sick person.
- Once infected there are symptoms of fever for a few days, then follow with an acute pneumonia.

財團法人國家衛生研究院
國家流行病學及感染病防治中心





The situation

- A SARS patient were sent to Ho-Pin Hospital without notifying medical staff.
- Cross infection spread in the hospital. Similar pattern of infection repeated in major hospitals of Taipei and Kaoshung, including medical centers.
- 95% infection is of medical staff and their relatives and friends. The quarantine, exhaustion and fear results in depletion of medical staff.

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國際疾病預防控制中心



The Temporal Urgency

- Most medical doctors and nurses worked day and night and some with a little protection. Remote and collaborative diagnosis becomes a real issue.
- Due to the gradual depletion of medical staff, we decide to help and racing with time to realize it.

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Some important Historical Docs

Quick Note: (4/29)

防疫格網 (Epidemic Grid 暫訂)

- * 1-2 white-page proposal
- * Unique IP Address (如 IPv6 的地址) 以便於追蹤與識別
- * 感應器Sensors 與手機結合手機 考慮的量測數值 -- 體溫 (e.g. 紅外線) -- 脈搏 -- 位置座標 (GPS)
- * 居家看護或隔離之電話回報 (Call center) 與網路連結 (以WWW網頁輸入)
- * 以中心為 testbed, single portal (1 週內) 與上班系統整合 (以中心MIS team 為主)
- * Access Grid PC 版個人型視訊整合 (以中心為例) * 期於一週內有初步系統整合成果 (4/30-5/7)



Asthma Grid => SARS Grid (7, May)

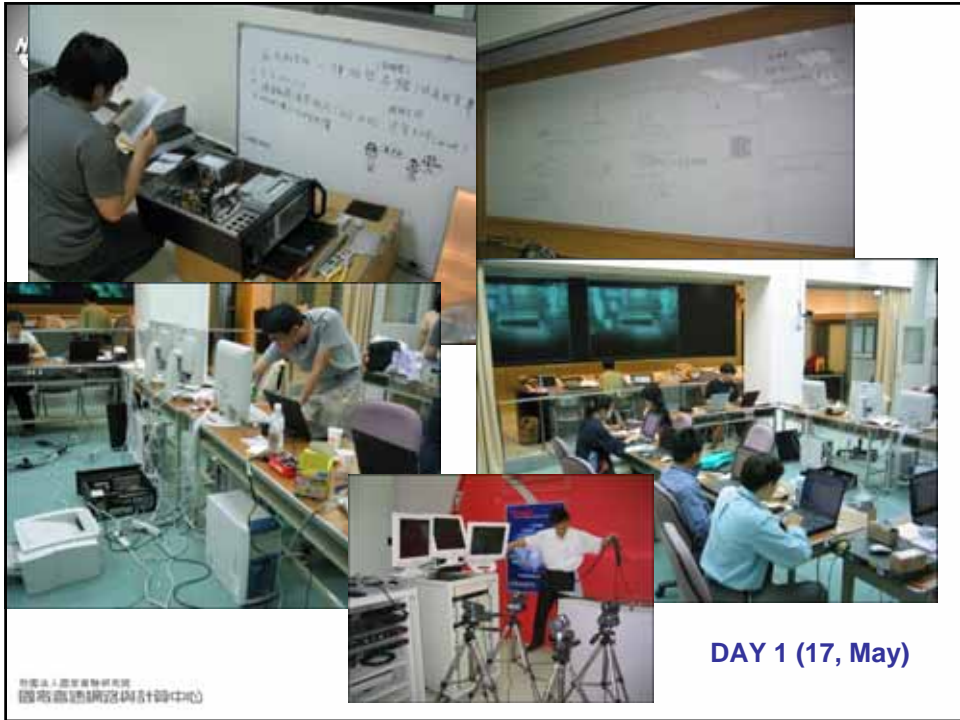
[SARS AG Task Force](#) (14, May)

[PRAGMA Urgent Call for Help](#) (16, May)



SARS Combat Begins

People had been working around the clock to assemble and test a **Grid system**, consisting systems of **Access Grid**, **H.323 VTC**, **medical information management**, **emergency dispatch** and **network monitoring**.








DAY 6 (22, May)
Remote Diagnosis Test

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醫務資訊研究所資訊中心



DAY 13 (29, May)
Mega test for AG



 **The work**

- Find immediate solution from the current Grid works:
 - Asthma Grid, Access Grid and Ecogrid.
 - Specific medical information network
 - Construct AG nodes for hospitals.
 - Integrate GIS system.
 - Monitor the quarantined rooms.
- 3 Hospitals and CDC have AG nodes setup and in operation. Dedicated network is deployed.
- SARS Grid portal www.sarshope.org developed
- SARS spread GIS portal developed
- International Supports:
 - http://www.npaci.edu/Press/03/052903_SARS.html
 - <http://ncmir.ucsd.edu/news/>

国家卫生信息研究所
 国家网络与信息安全保障中心

SARS Grid

By Ryan S. M Wang

The Plan:
Connecting 10 Medical Centers & 22 SARS dedicated hospitals.