Why was NIC.PR interested?

- NIC.PR was a research laboratory involved in various research projects that included:
  - Watermarking
  - Public Key Cryptography
- Being a technology center of Computing Science, NIC.PR considered DNSSEC to be an area of interest.
• Circa 2000, the local government website was redirected to a malicious site at the ISP level.
• Completely avoidable had DNSSEC been available.
• Shortly after Sweden (.se) became the first ccTLD to offer DNSSEC, it became clear that this was the way to go.
<table>
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<tr>
<th>When was DNSSEC activated?</th>
<th>NIC.PR started signing the zones on July 2006.</th>
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<td>NIC.PR started transmitting DNSSEC zones to the public server for the first time in August 2006.</td>
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</table>
List of DNSSEC signed zones at deployment (2006):

- .pr
- .nic.pr
- .com.pr
- .net.pr
- .org.pr
- .isla.pr
- .edu.pr
- .gov.pr
- .pro.pr
- .biz.pr
- .info.pr
- .name.pr
An informational website was created at http://dnssec.nic.pr to publish .pr DNSSEC related information.

The local government was encouraged to sign the domain gobierno.pr.

Signed and hosted DNS zones of clients under the incentives program.
.pr zones were signed on a Windows 2003 Server machine.

Zone file generation and DNSSEC signing were performed using VBScript.

- `dnssec-keygen -a rsasha1 -b 1024 -n zone [domainname]`
- `dnssec-keygen -a rsasha1 -b 2048 -f KSK -n zone [domainname]`
- `dnssec-signzone -o [domain] -t -g -k [KSK] [zone file] [ZSK]`

DNSSEC functionality was verified by:

- Querying OARC’s open DNSSEC resolvers (149.20.64.20, 149.20.64.21)
- `http://www.dnsviz.net`

Operational Experiences
.pr had two colocations; One with Critical Hub and the other in a bunker with AT&T.

Having Any Cast helped because it maintain the DNS redundant at a global and local level.

We never lost our DNS

How did PRTLD continue to be Operational During and After Hurricane Maria?
Lost of Telecommunication Towers...

- “Hasta el 26 de septiembre, el 95% de la isla no tenía electricidad, menos de la mitad de la población tenía agua corriente y el 95% de la isla no tenía servicio de telefonía celular e internet.”
- Comparación del sistema eléctrico de Puerto Rico antes y después del Huracán María - Imágenes tomadas por la NASA desde el espacio
• Was a tool that helped us identify the domains from the affected territories by Hurricane Maria.
Telecommunications Service: 98.50%
Last update: 02/feb/2018
Source: JRTC
Note: Incluye Servicio Alámbrico e Inalámbrico.

Cell Sites: 93.11%
Last update: 02/feb/2018
Source: JRTC

Gas Stations: 88%
Last update: 26/dec/2017
Source: DAnC

Supermarket: 92%
Last update: 26/dec/2017
Source: MIDA

Businesses Processing PAN: 1,910
Last update: 15/dec/2017
Source: Departamento de la Familia
Note: Programa de Asistencia Nutricional - EBT.
El total está basado en la capacidad de procesamiento regular.

Shelters: 5
Last update: 08/feb/2018
Source: Vivienda
Note: 2:30 PM.
Protecting Customers: Cyber Real Estate

- The statistics of how many domains we renewed were about approximately 626 domains. We had first and second level domains (.pr, .com.pr, isla.pr, org.pr, etc.) There were no renewal fees, and the date was extended to Feb 1st.
As part of our process to renew these name was performing a search in our database of all domain names who's country was Puerto Rico or any other known territory (Antigua and Barbuda, Saint Martin, US Virgin Island) that were affected by the pass of Hurricanes Irma and/or Maria.
We MUST Understand that….

- The Latin American and Caribbean Region is known for its vulnerability to natural disasters. (e.g.: Earthquakes, tsunamis and hurricanes)

- Near the time that Hurricane Maria was passing over Puerto Rico, Mexico experienced a major earthquake, thus it is important that registries operators are aware that their users could be uncommunicated during these type of disasters. Consequently, new policies should be instituted to ensure the protection of their cyber real estate.
Thank you!