DSSA Update

Costa Rica – March, 2012

Goals for today

- Update you on our progress
- Raise awareness
- Solicit your input

Charter: Goals and Objectives

Report to participating SO's and AC's on:

- Actual level, frequency and severity of threats to the DNS
- Current efforts and activities to mitigate these
- Gaps in the current response to DNS issues
- Possible additional risk mitigation activities that would assist in closing those gaps

Activity since Singapore

- The working group has:
  - Developed a protocol for handling confidential information
  - Selected, and begun to tailor, a methodology to structure the remaining work
  - Begun the risk assessment

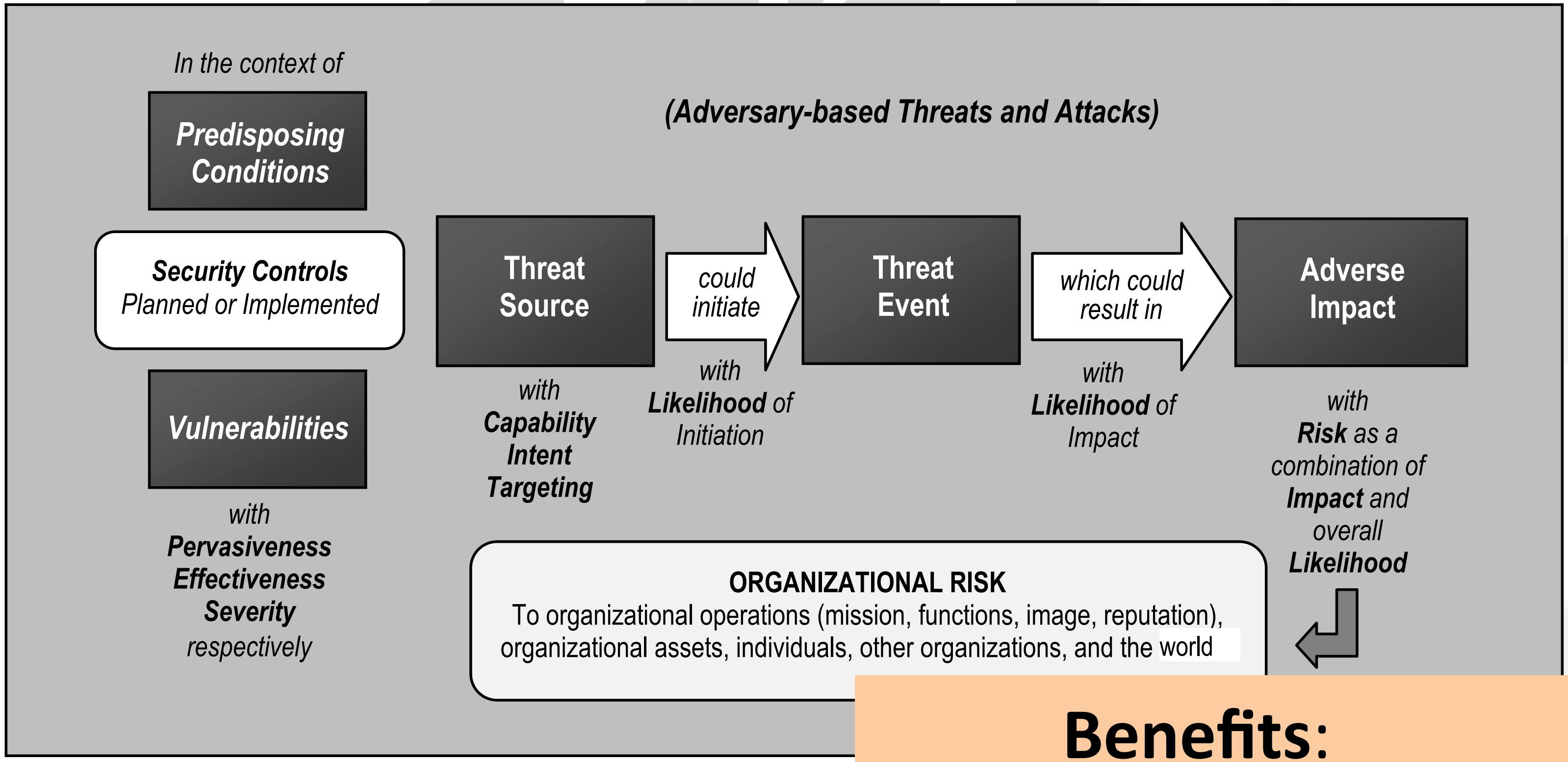
Methodology – NIST 800-30

Rationale

- Using a predefined methodology will save time and improve our work product
- Reviewed several dozen alternatives
- We selected this one because it's:
  - Available at no cost
  - Actively supported and maintained
  - Widely known and endorsed
  - Reusable elsewhere in ICANN

Methodology – NIST 800-30

Example – Adversarial Risk Model



In the context of

Predisposing Conditions

Security Controls Planned or Implemented

Vulnerabilities

with **Pervasiveness** **Effectiveness** **Severity** respectively

(Adversary-based Threats and Attacks)

Threat Source

with **Capability** **Intent** **Targeting**

could initiate

with **Likelihood** of Initiation

Threat Event

which could result in

with **Likelihood** of Impact

Adverse Impact

with **Risk** as a combination of **Impact** and overall **Likelihood**

ORGANIZATIONAL RISK

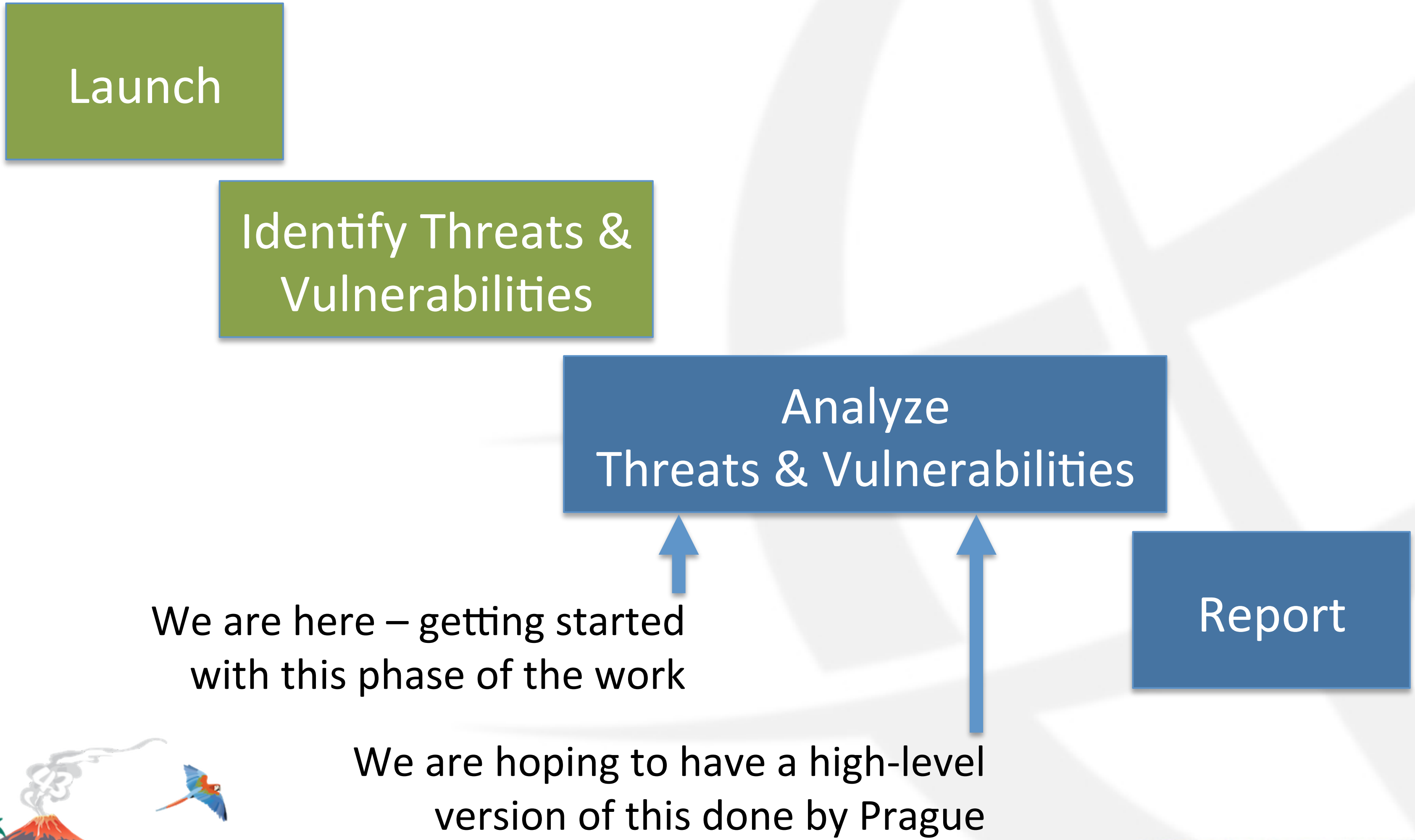
To organizational operations (mission, functions, image, reputation), organizational assets, individuals, other organizations, and the world

Benefits:

- Consistent terminology
- Defined process
- Sample deliverables

Where we are…

Approach



Launch

Identify Threats & Vulnerabilities

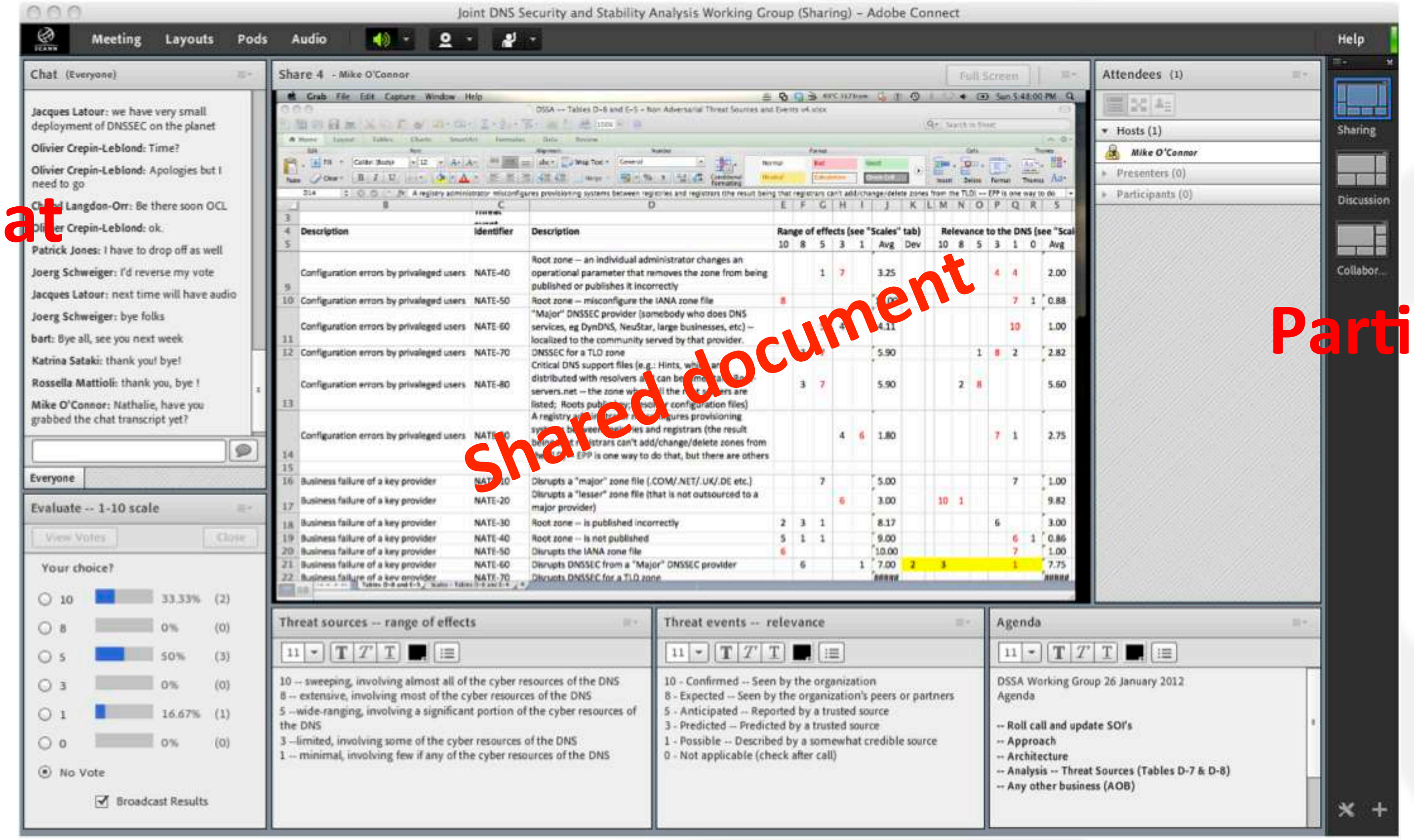
Analyze Threats & Vulnerabilities

Report

We are here – getting started with this phase of the work

We are hoping to have a high-level version of this done by Prague

How we work



Chat (Everyone)

Jacques Latour: we have very small deployment of DNSSEC on the planet
Olivier Crepin-Leblond: Time?
Olivier Crepin-Leblond: Apologies but I need to go
Ch[illegible] Langdon-Orr: Be there soon OCL
Oli[illegible]er Crepin-Leblond: ok.
Patrick Jones: I have to drop off as well
Joerg Schweiger: I'd reverse my vote
Jacques Latour: next time will have audio
Joerg Schweiger: bye folks
bart: Bye all, see you next week
Katrina Sataki: thank you! bye!
Rossella Mattioli: thank you, bye !
Mike O'Connor: Nathalie, have you grabbed the chat transcript yet?

Everyone

Evaluate -- 1-10 scale

View Votes Close

Your choice?

○ 10	33.33%	(2)
○ 8	0%	(0)
○ 5	50%	(3)
○ 3	0%	(0)
○ 1	16.67%	(1)
○ 0	0%	(0)

● No Vote

☑ Broadcast Results

A registry administrator misconfigures provisioning systems between registries and registrars (the result being that registrars can't add/change/delete zones from the TLD) -- EPP is one way to do

	B	C	D	E	F	G	H	I	J	K	M	N	O	P	Q	R	S
3		Threat event															
4	Description	identifier	Description	Range of effects (see "Scales" tab)							Relevance to the DNS (see "Scal						
5				10	8	5	3	1	Avg	Dev	10	8	5	3	1	0	Avg
9	Configuration errors by privaleged users	NATE-40	Root zone -- an individual administrator changes an operational parameter that removes the zone from being published or publishes it incorrectly			1	7		3.25					4	4		2.00
10	Configuration errors by privaleged users	NATE-50	Root zone -- misconfigure the IANA zone file	8					[illegible]						7	1	0.88
11	Configuration errors by privaleged users	NATE-60	"Major" DNSSEC provider (somebody who does DNS services, eg DynDNS, NeuStar, large businesses, etc) -- localized to the community served by that provider.			[illegible]	4		4.11						10		1.00
12	Configuration errors by privaleged users	NATE-70	DNSSEC for a TLD zone		[illegible]	[illegible]			5.90				1	8	2		2.82
13	Configuration errors by privaleged users	NATE-80	Critical DNS support files (e.g.: Hints, wh[illegible] ar[illegible] distributed with resolvers a[illegible] can be [illegible] servers.net -- the zone wh[illegible] all the r[illegible] [illegible]ers are listed; Roots publ[illegible] [illegible] configuration files)		3	7			5.90			2	8				5.60
14	Configuration errors by privaleged users	NAT[illegible]0	A registry a[illegible] [illegible]gures provisioning sy[illegible] between [illegible]ies and registrars (the result bein[illegible] [illegible] registrars can't add/change/delete zones from the[illegible] -- EPP is one way to do that, but there are others				4	6	1.80					7	1		2.75
15																	
16	Business failure of a key provider	NAT[illegible]10	Disrupts a "major" zone file (.COM/.NET/.UK/.DE etc.)			7			5.00						7		1.00
17	Business failure of a key provider	NATE-20	Disrupts a "lesser" zone file (that is not outsourced to a major provider)				6		3.00		10	1					9.82
18	Business failure of a key provider	NATE-30	Root zone -- is published incorrectly	2	3	1			8.17					6			3.00
19	Business failure of a key provider	NATE-40	Root zone -- is not published	5	1	1			9.00						6	1	0.86
20	Business failure of a key provider	NATE-50	Disrupts the IANA zone file	6					10.00						7		1.00
21	Business failure of a key provider	NATE-60	Disrupts DNSSEC from a "Major" DNSSEC provider		6			1	7.00	2	3				1		7.75
22	Business failure of a key provider	NATE-70	Disrupts DNSSEC for a TLD zone						#####								#####

Threat sources -- range of effects

10 -- sweeping, involving almost all of the cyber resources of the DNS
8 -- extensive, involving most of the cyber resources of the DNS
5 --wide-ranging, involving a significant portion of the cyber resources of the DNS
3 --limited, involving some of the cyber resources of the DNS
1 -- minimal, involving few if any of the cyber resources of the DNS

Threat events -- relevance

10 - Confirmed -- Seen by the organization
8 - Expected -- Seen by the organization's peers or partners
5 - Anticipated -- Reported by a trusted source
3 - Predicted -- Predicted by a trusted source
1 - Possible -- Described by a somewhat credible source
0 - Not applicable (check after call)

Agenda

DSSA Working Group 26 January 2012
Agenda

-- Roll call and update SOI's
-- Approach
-- Architecture
-- Analysis -- Threat Sources (Tables D-7 & D-8)
-- Any other business (AOB)

Live chat

Shared document

Participants

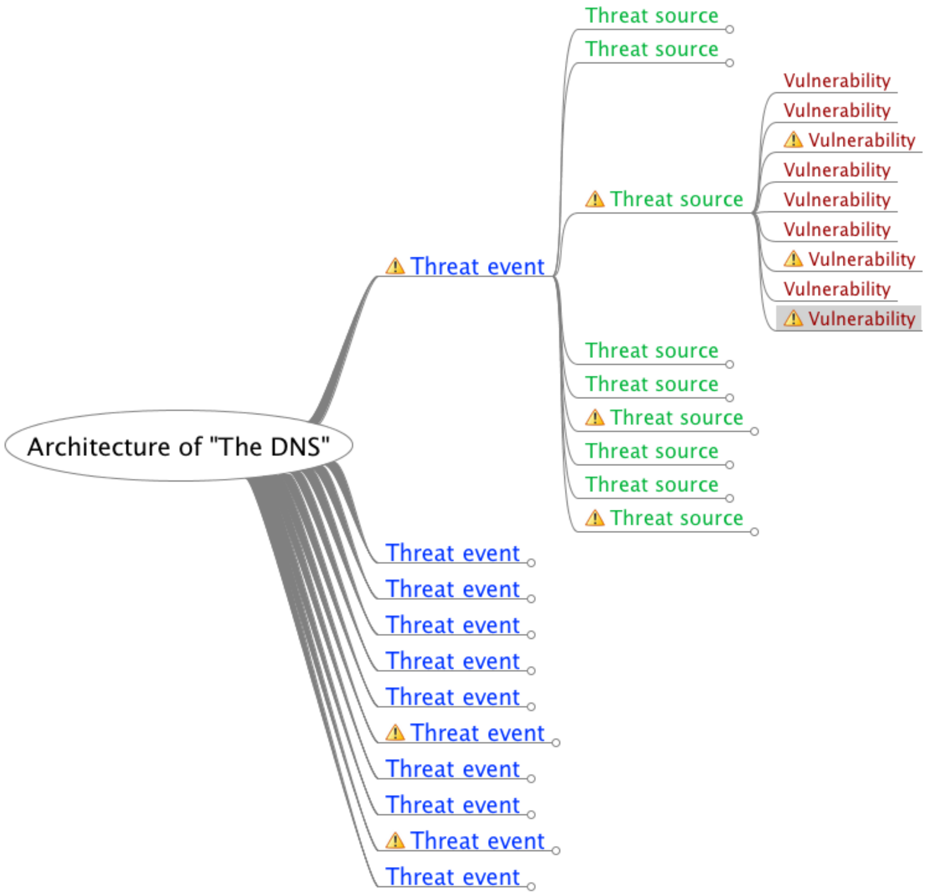
Polling

Definitions

Agenda

Problem: the evaluation per NIST methodology does not scale

It's all about choices



- Threat tree could easily grow to over 1000 permutations
- Prune the tree along the way, in order to focus on the highest risks
- Leave a framework that can be used to address:
  - New things
  - Changes
  - Greater detail

Where we are…

How to cope with an exploding analysis tree

Threat events:

- Zone does not resolve
- Zone is incorrect
- Zone security is compromised

Level of Impact:

In the worst case there would be broad harm/consequence/ impact to operations, assets, individuals, other organizations and the world if any of these threat-events occur.

In all cases there would be significant problems for registrants and users in the zone.

Where we are going

- 43 weeks (or 43 hours)
- We've developed substantial (and reusable)
  - **Data**
  - **Methods**
- … but given our **resources**, we can't analyze in detail *and* accuracy *and* do so fast:
  - Identify every threat source and event or analyze high-risk scenarios first
  - 6 months vs. say 36

Where we are going

- **Vulnerabilities** – severe and widespread?
- **Predisposing conditions** – pervasive?
- **Controls and mitigation** – effective and deployed?

- **Threat sources** – how broad is range of impact, what are their capabilities, how strong is their intent, are they targeting the DNS?
- **Initiation** – what is the likelihood that a threat-event will happen?

- Given all of the above **– what are the high-risk scenarios?**

Questions?

Joerg Schweiger, ccNSO's co-chair to the DSSA-WG

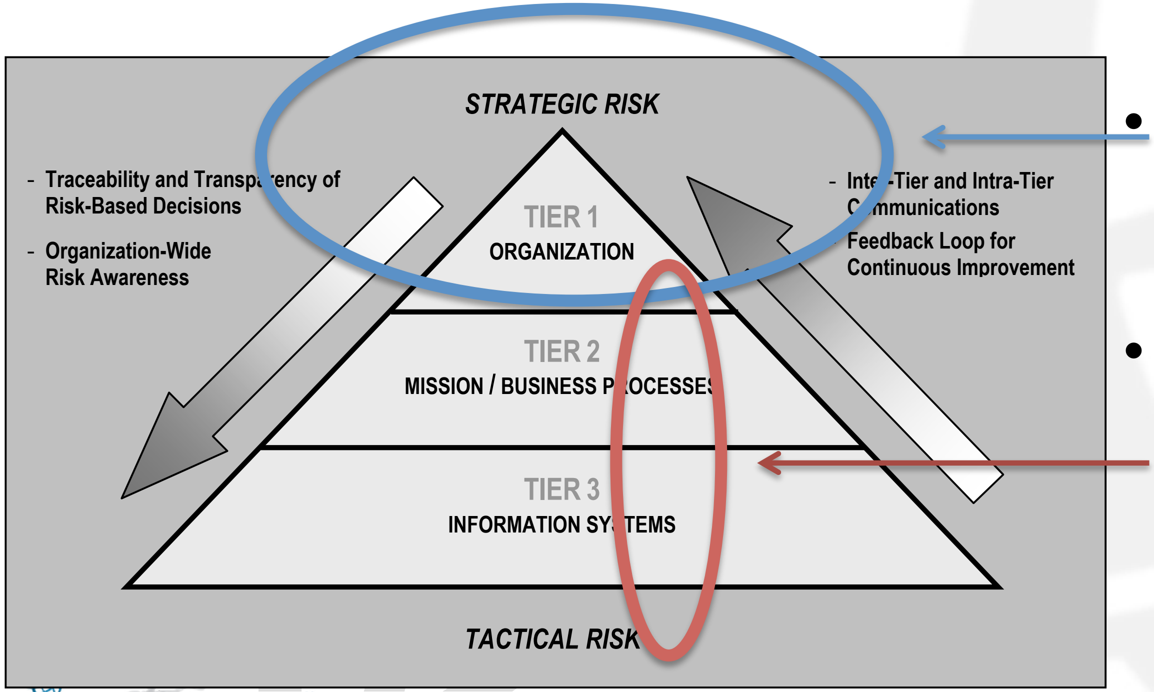
joerg.schweiger@denic.de

Charter: Background

At their meetings during the ICANN Brussels meeting the At-Large Advisory Committee (ALAC), the Country Code Names Supporting Organization (ccNSO), the Generic Names Supporting Organization (GNSO), the Governmental Advisory Committee (GAC), and the Number Resource Organization (NROs) acknowledged **the need for a better understanding of the security and stability of the global domain name system (DNS)**. This is considered to be of **common interest** to the participating Supporting Organisations (SOs), Advisory Committees (ACs) and others, and should be preferably **undertaken in a collaborative effort.**

Methodology – NIST 800-30

Risk Management Hierarchy


STRATEGIC RISK
- Traceability and Transparency of Risk-Based Decisions
- Organization-Wide Risk Awareness
TIER 1
ORGANIZATION
TIER 2
MISSION / BUSINESS PROCESSES
TIER 3
INFORMATION SYSTEMS
- Inter-Tier and Intra-Tier Communications
- Feedback Loop for Continuous Improvement
TACTICAL RISK

The methodology presumes a tiered approach to the work

- DSSA is chartered to look at the broadest, most general tier
- However it may be useful to pursue one or two deeper, narrower analyses of specific threats once the "survey" work is complete

Confidential information

Note: Sensitivity, attribution **and release to public** are determined by info-provider	**Sensitive**		**Not sensitive**
Not attributed to source (transmitted through trusted 3rd party or summaries of Type 1 developed by sub-group)	Type 2: Distributed to sub-groups only. (Info-providers determine ultimate distribution)	**Info-provider authorizes release**	Type 3: Distributed to DSSA and public ("sanitized" info from sub-groups and other non-attributed information)
Attributed to source	Type 1: Distributed to sub-groups only (under NDA, most-protected)	Confidential info must never pass through this path. This is the exposure of information we're trying to prevent.	Type 4: Distributed to DSSA and public

Unpacking some terms

Our charter speaks to "Threats"

Threat-events (what happens) should not be confused with:

- **Adverse impacts -** that may result
- **Vulnerabilities -** that allow them to happen
- **Predisposing conditions -** that help prevent them
- **Threat-sources –** that initiate them
- **Controls and mitigation** – that reduce likelihood and impact

Where we are…

Determinations – **Nature of impact**

- Damage to a critical infrastructure sector
- Damage to trust relationships or reputation
- Harm to individuals
- Harm to assets
- Harm to operations