



# Ministério da Fazenda

Serviço Federal de Processamento de Dados (SERPRO)

# A Resposta a Incidentes no Processo de Desenvolvimento Seguro

Daniel Araújo Melo - [daniel.melo@serpro.gov.br](mailto:daniel.melo@serpro.gov.br)

1o. Fórum Brasil-Amazônia de TIC - 11/11/2011



Ligado nas  
**Comunidades**

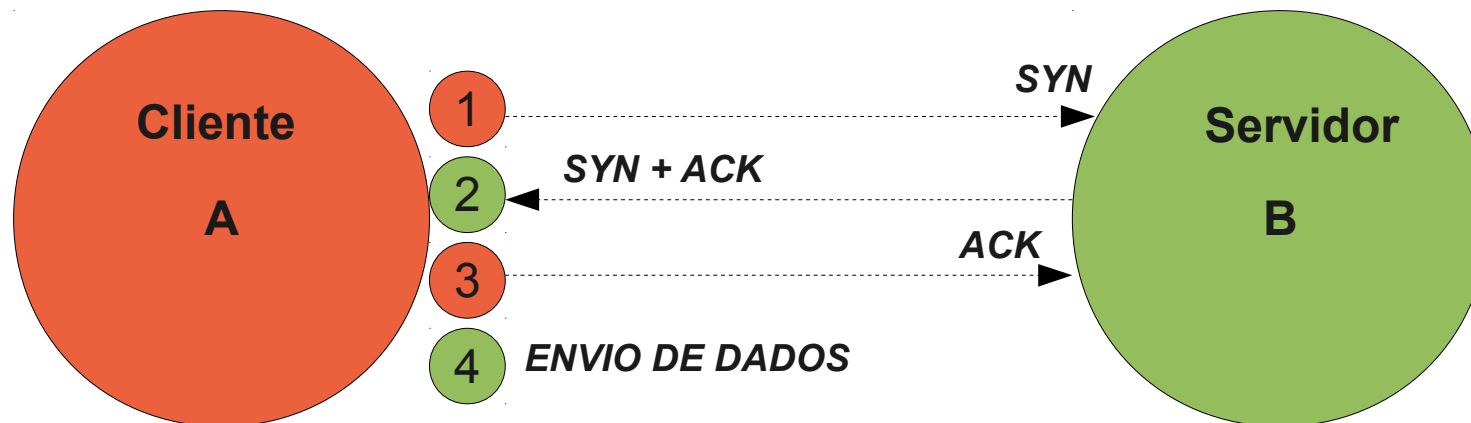
 **SERPRO**  
Serviço Federal de Processamento de Dados

# Agenda

- **Segurança em TIC**
- **Resposta a Incidentes**
- **Processo de Resposta a Incidentes**
- **Resposta a Ataques no SERPRO**

# História

- **1996 – 14.000 computadores conectados à Internet**
- **TCP - Principal Protocolo**
- **1 de setembro – Phrack Magazine publica exploit que explora característica do Destinatário**
  - Destinatário aloca recursos ao receber (1)



# Ciclo de Vida das Vulnerabilidades

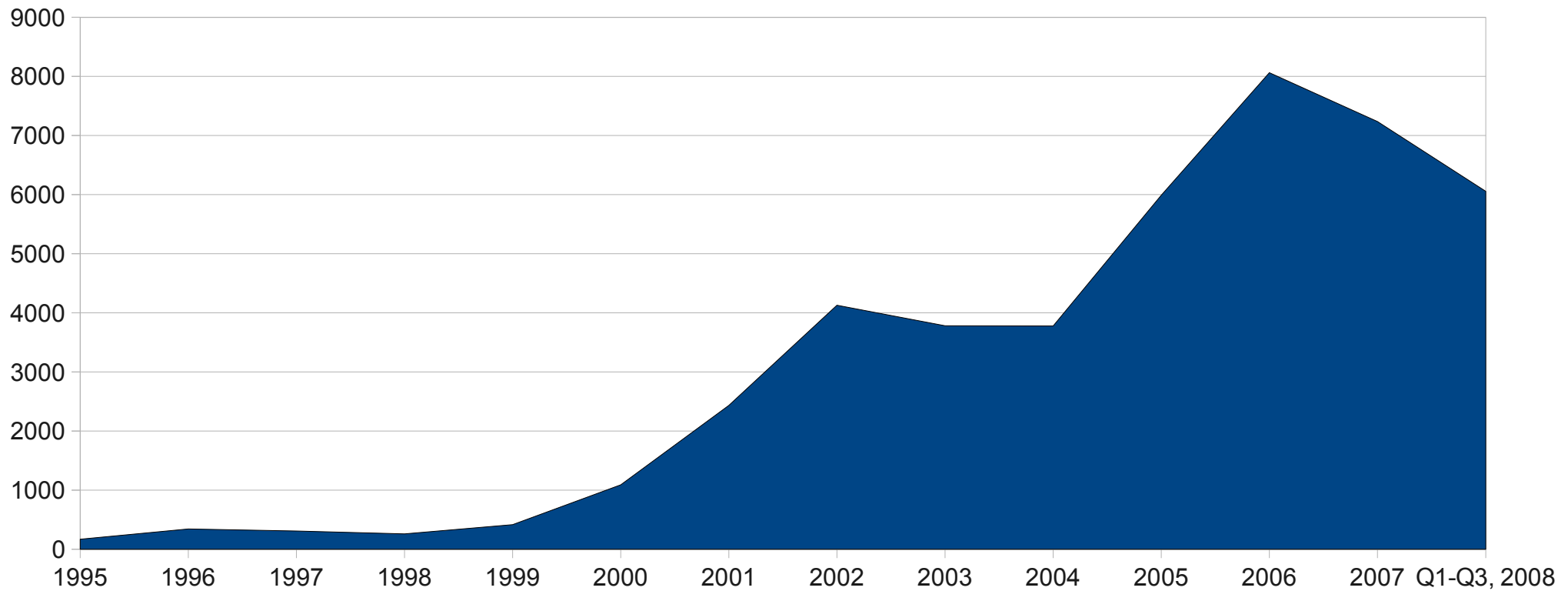
- **Alguém descobre a vulnerabilidade;**
- **Atacantes analisam e produzem exploits;**
- **Ataques ocorrem;**
- **Defensores buscam correção;**
- **Soluções paliativas são propostas;**
- **Correção é publicada;**
- **Após alguns meses, malware é lançado.**



# Vulnerabilidades Reportadas



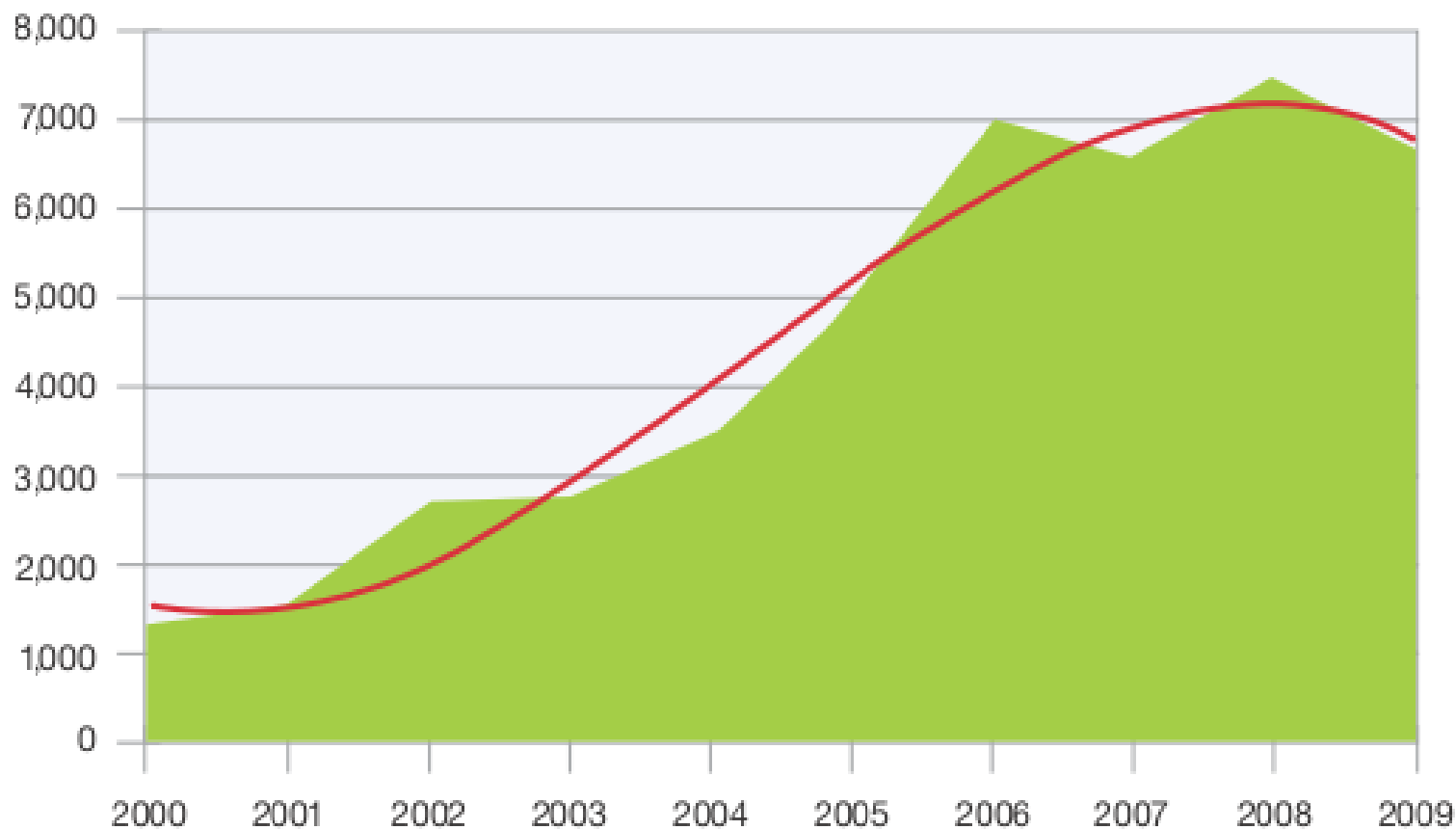
## Vulnerabilidades Reportadas ao Cert/CC



# Vulnerabilidades Reportadas



## Vulnerability Disclosures 2000-2009



Fonte: IBM X-Force 2009 Trend and Risk Report

# Quanto é muito?



- **3784 vulnerabilidades reportadas em 2003**
  - $3784 * 20$  minutos para ler = 158 dias
  - Supondo que você seja afetado por 10%
  - $378 * 1$  hora para instalar correção = 47 dias para instalar todas as correções em 1 sistema.
  - Para ler notícias de segurança e corrigir 1 sistema
    - $158 + 47 = 205$  dias



# Quanto é muito?

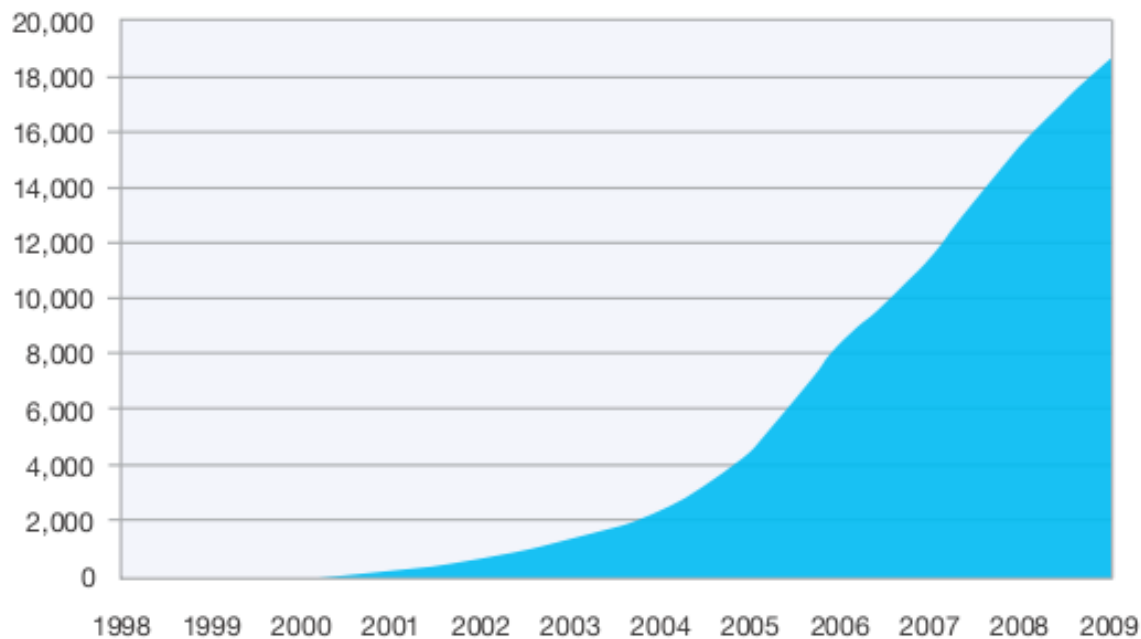


- **Wietse Venema estima que em geral existe 1 falha de segurança por 1000 linhas de código**
  - Kernel Linux ultrapassou 13 milhões de linhas
    - <http://www.h-online.com/open/features/What-s-new-in-Linux-2-6-36-1103009.html?page=6>
  - Um sistema desktop pode possuir mais de 100 milhões de linhas de código
- **Necessários 20 anos para identificar todas as falhas de um sistema desktop;**
- **10% a 15% das correções inserem novas vulnerabilidades.**

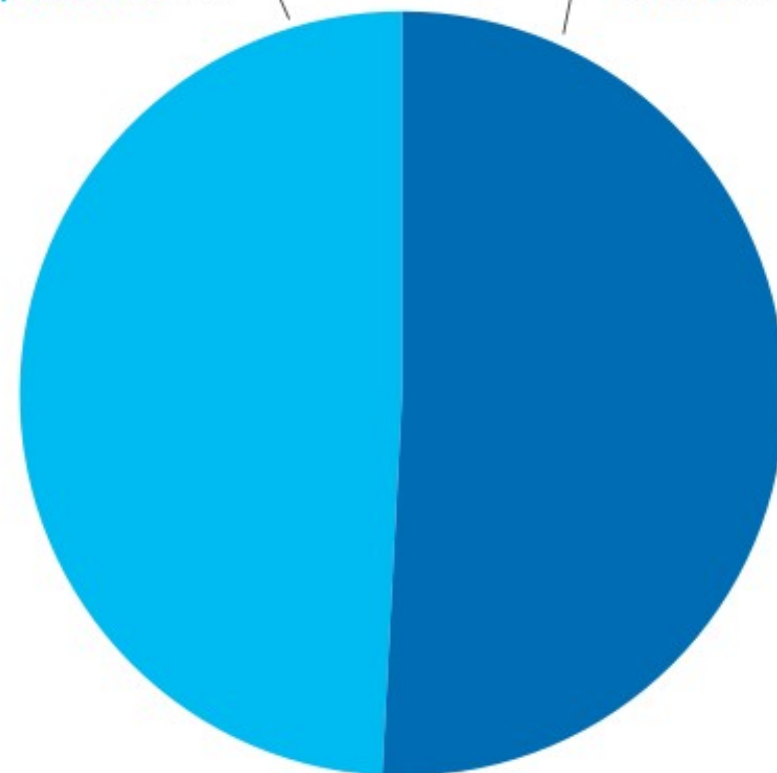
# Vulnerabilidades WEB



**Cumulative Count of Web Application  
Vulnerability Disclosures  
1998-2009**



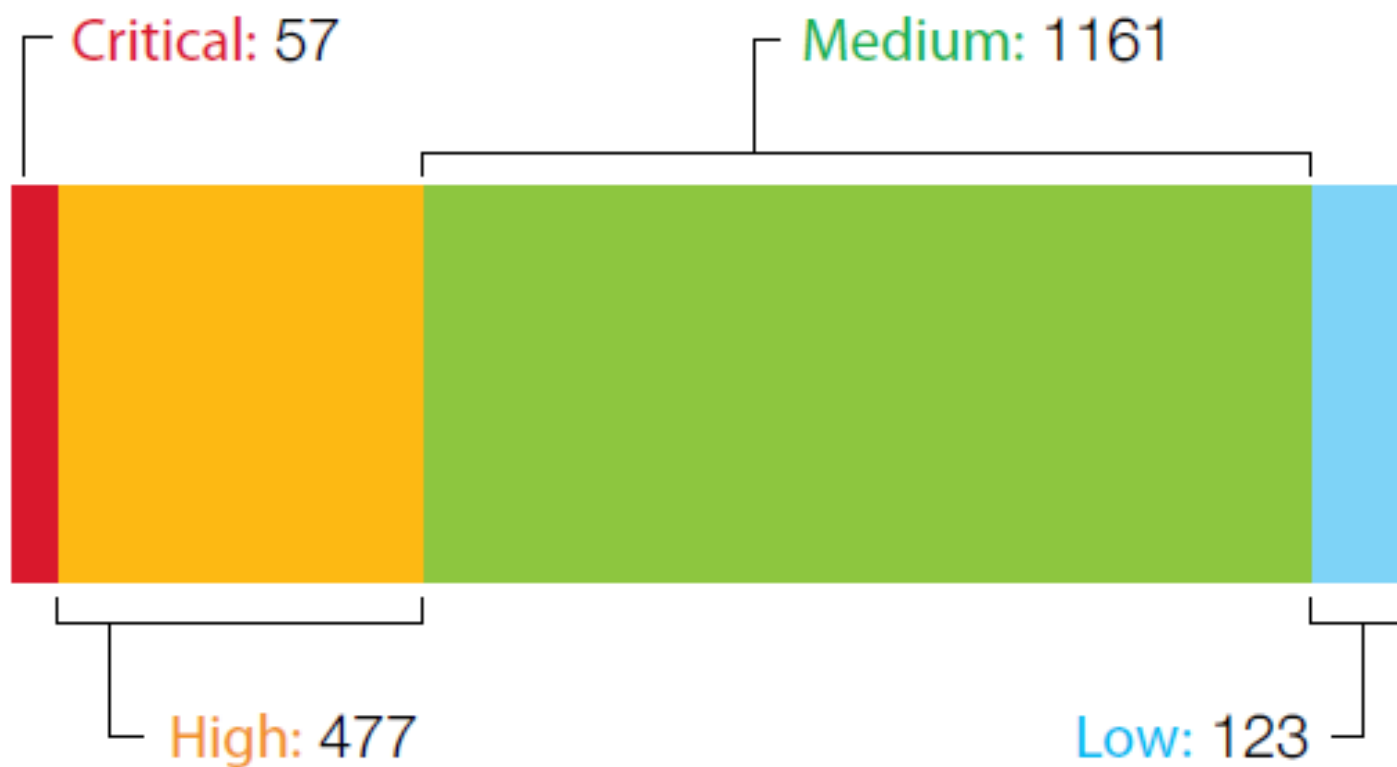
**Web Applications: 49%**      **Others: 51%**



Fonte: IBM X-Force 2009 Trend and Risk Report



Total Vulnerabilities in Q1 2011: 1818



Source: IBM X-Force



Novas Vulnerabilidades  
+  
Nenhum mecanismo de segurança é 100% confiável!  
=  
Incidentes de Segurança podem ocorrer...



Como responder a um Incidente?



Empiricamente percebe-se que:

Quanto mais ágil for a recuperação de um incidente,  
menor será o prejuízo.

# Resposta a Incidentes



- **RFC 2350 – BCP 21**
  - Expectations for Computer Security Incident Response

Network Working Group  
Request for Comments: 2350  
BCP: 21  
Category: Best Current Practice

N. Brownlee  
The University of Auckland  
E. Guttman  
Sun Microsystems  
June 1998

## Expectations for Computer Security Incident Response

### Status of this Memo

This document specifies an Internet Best Current Practices for the Internet Community, and requests discussion and suggestions for improvements. Distribution of this memo is unlimited.

### Copyright Notice

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### Abstract

The purpose of this document is to express the general Internet community's expectations of Computer Security Incident Response Teams (CSIRTs). It is not possible to define a set of requirements that would be appropriate for all teams, but it is possible and helpful to list and describe the general set of topics and issues which are of concern and interest to constituent communities.

# Resposta a Incidentes



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Computer Security Incident Response

Current Practices for the  
Incident Response Team and suggestions for  
improvement. The scope of the document is unlimited.

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# Programa CERT



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Carnegie Mellon

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information for

[System Administrators](#)

[Developers](#)

[Researchers](#)

[Managers](#)

[Prospective Employees](#)

## Welcome to CERT

### *about us*

CERT, the home of the well-known [CERT@ Coordination Center](#), is located at Carnegie Mellon University's Software Engineering Institute. We study internet security vulnerabilities, research long-term changes in networked systems, and develop information and training to help you improve security.

### Our areas of focus

- software assurance
- secure systems
- organizational security
- coordinated response
- training

[Take the tour](#)

### CERT Spotlight: XNET

#### How can you ensure that your staff is prepared?

Responding to critical cyber events requires technical knowledge and skills, decision-making abilities, and effective coordination. The best way to prepare your staff is to have them practice under realistic conditions; however, it can be difficult and expensive to create and administer these types of training scenarios.

Our [CERT® Exercise Network \(XNET\)](#) solves these problems. This platform allows organizations to create customized, realistic, interactive simulations on an isolated network. Through a web-based interface, participants across multiple locations can work together to analyze and respond to the latest



### Announcements

**October 17, 2011**

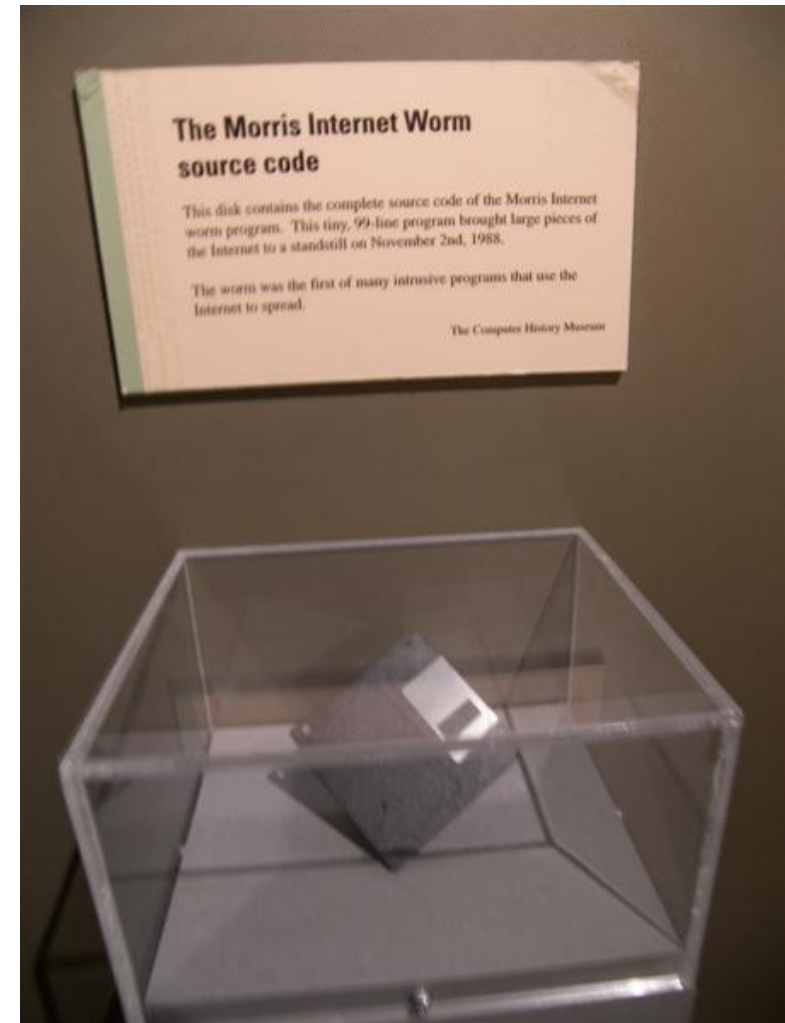
[New Insider Threat Blog Entry](#)  
The entry "Data Exfiltration and Output Devices - An Overlooked Threat" has been posted.

**October 14, 2011**

[CERT Oracle Secure Coding Standard for Java Book Published](#)  
The CERT Oracle Secure Coding Standard for Java has been published by Addison-Wesley Professional.

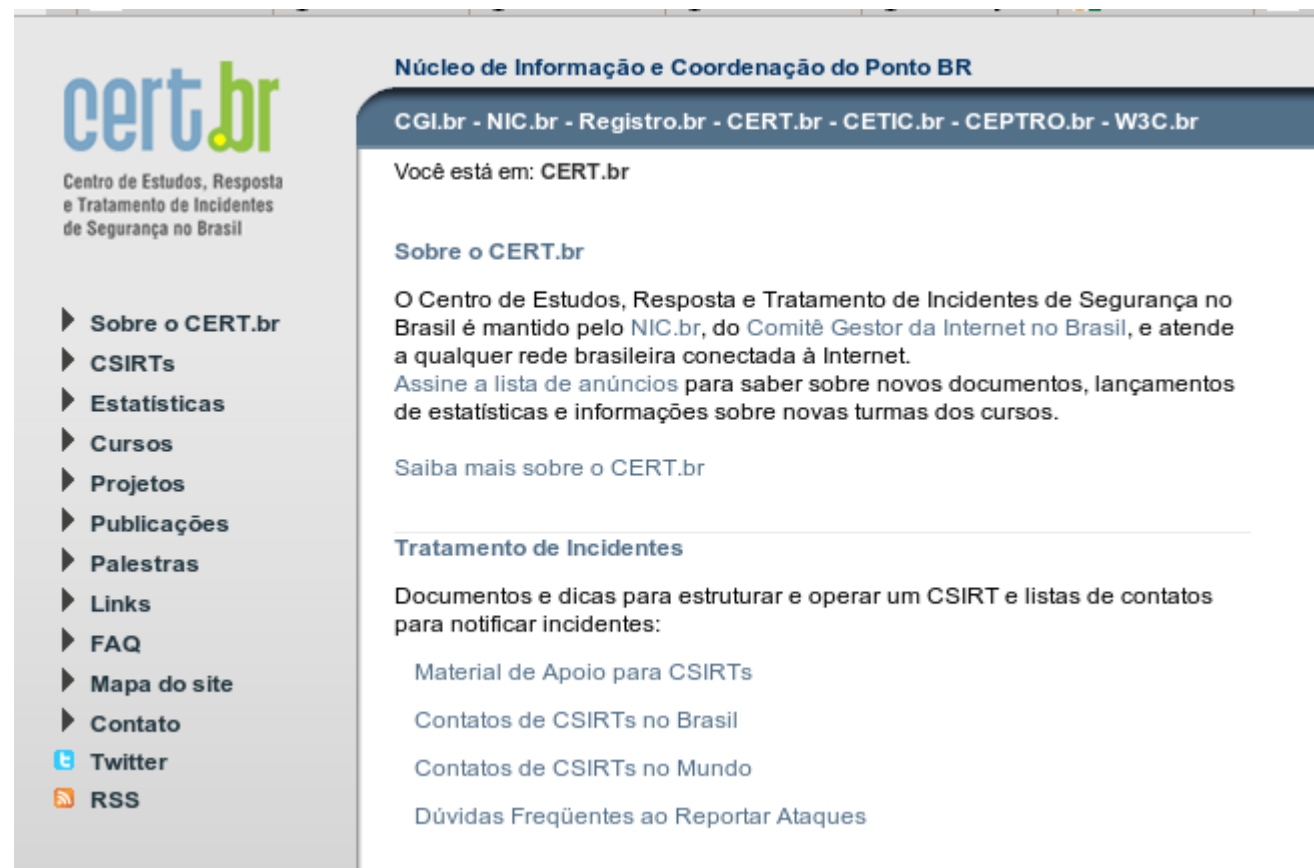
# Programa CERT

- **Criado em 1988**
- **Motivação:**
  - Incidente com o Worm de Morris
  - 10% da Internet foi afetada
  - Explorava múltiplas vulnerabilidades
- **Fianciado pela DARPA**
  - Defense Advanced Research Projects Agency
- **CSIRT Handbook**
  - Computer Security Incident Response Team Handbook



[http://en.wikipedia.org/wiki/Morris\\_worm](http://en.wikipedia.org/wiki/Morris_worm)

- **Centro de Estudos, Resposta e Tratamento de Incidentes de Segurança no Brasil**
- **Equipe de Resposta a Incidentes mantida pelo Comitê Gestor de Internet**

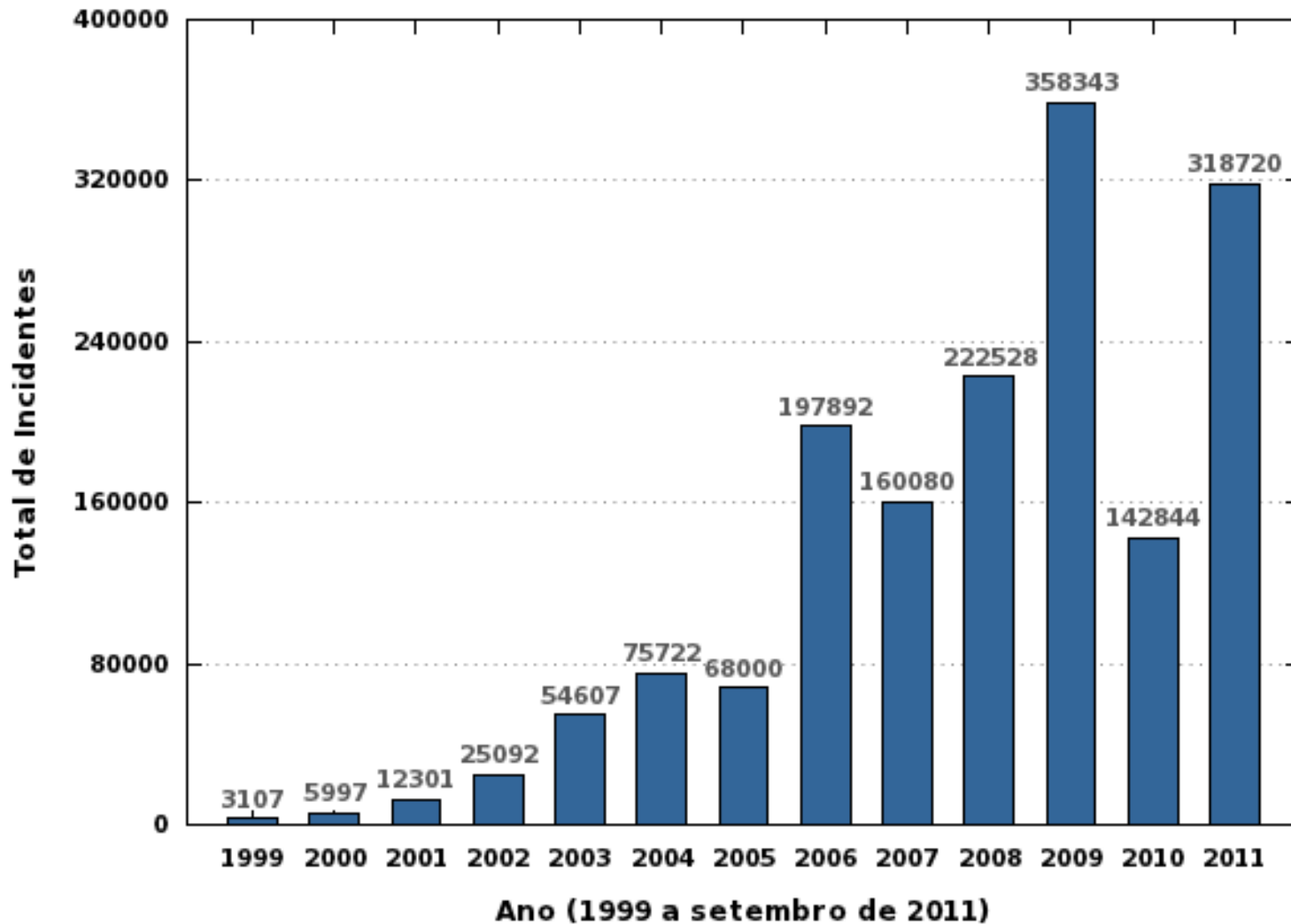


The screenshot shows the CERT.br website interface. On the left is a navigation menu with the following items: Sobre o CERT.br, CSIRTs, Estatísticas, Cursos, Projetos, Publicações, Palestras, Links, FAQ, Mapa do site, Contato, Twitter, and RSS. The main content area is titled 'Núcleo de Informação e Coordenação do Ponto BR' and includes a breadcrumb trail: CGI.br - NIC.br - Registro.br - CERT.br - CETIC.br - CEPTRO.br - W3C.br. Below this, it states 'Você está em: CERT.br'. The 'Sobre o CERT.br' section explains that the center is maintained by NIC.br, part of the Comitê Gestor da Internet no Brasil, and provides information on how to subscribe to newsletters. The 'Tratamento de Incidentes' section lists resources such as 'Material de Apoio para CSIRTs', 'Contatos de CSIRTs no Brasil', 'Contatos de CSIRTs no Mundo', and 'Dúvidas Frequentes ao Reportar Ataques'.



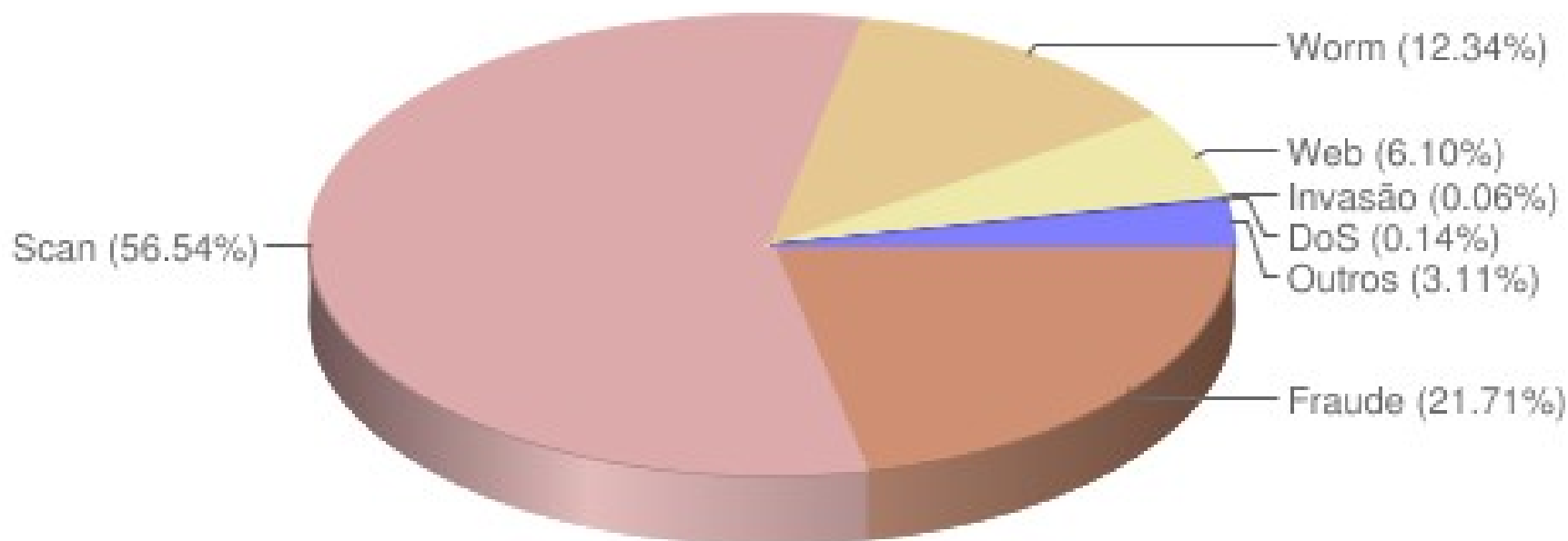
- **Estatísticas**

**Total de Incidentes Reportados ao CERT.br por Ano**





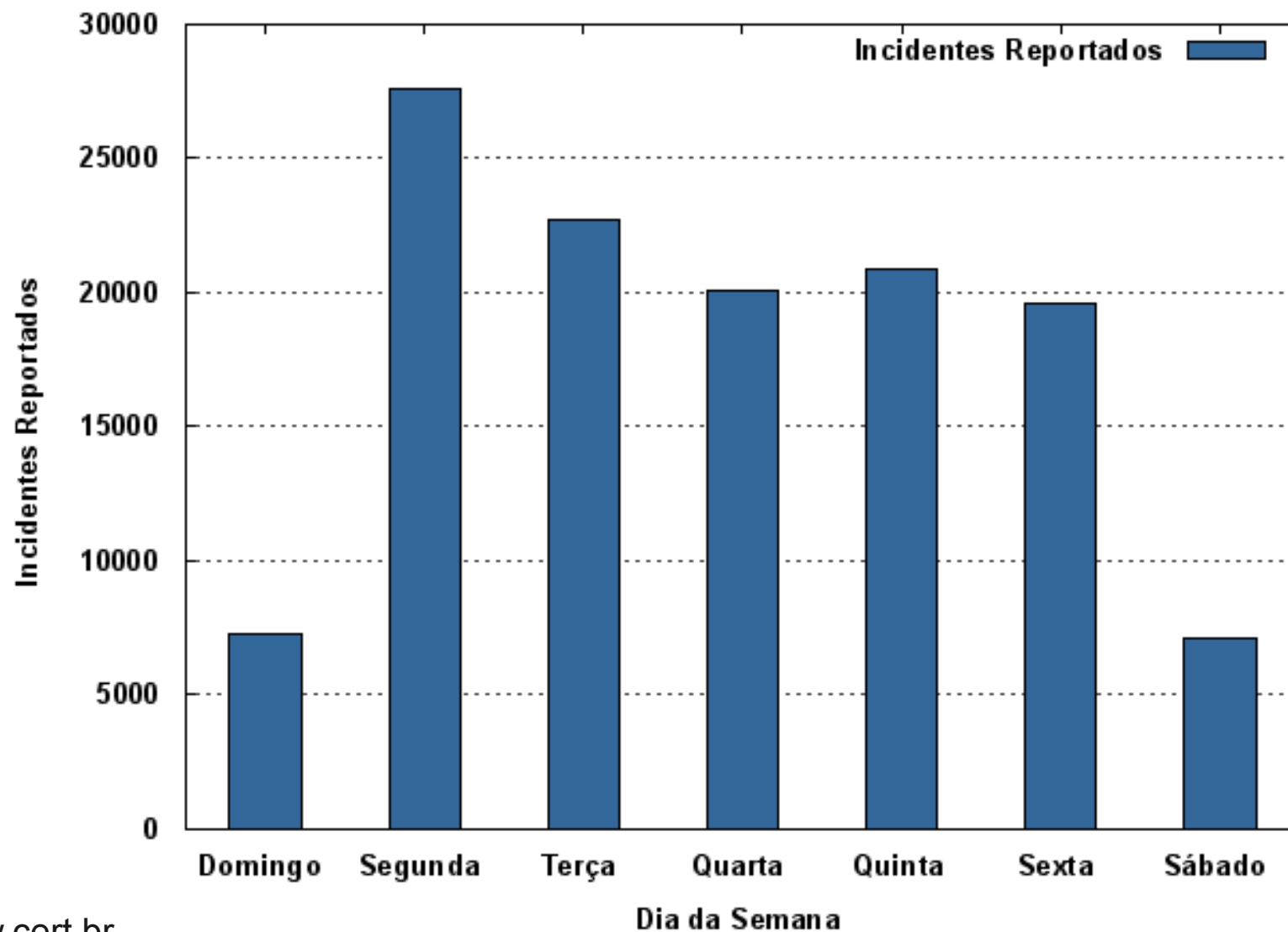
## Incidentes reportados (Tipos de ataque)



Fonte: [www.cert.br](http://www.cert.br)

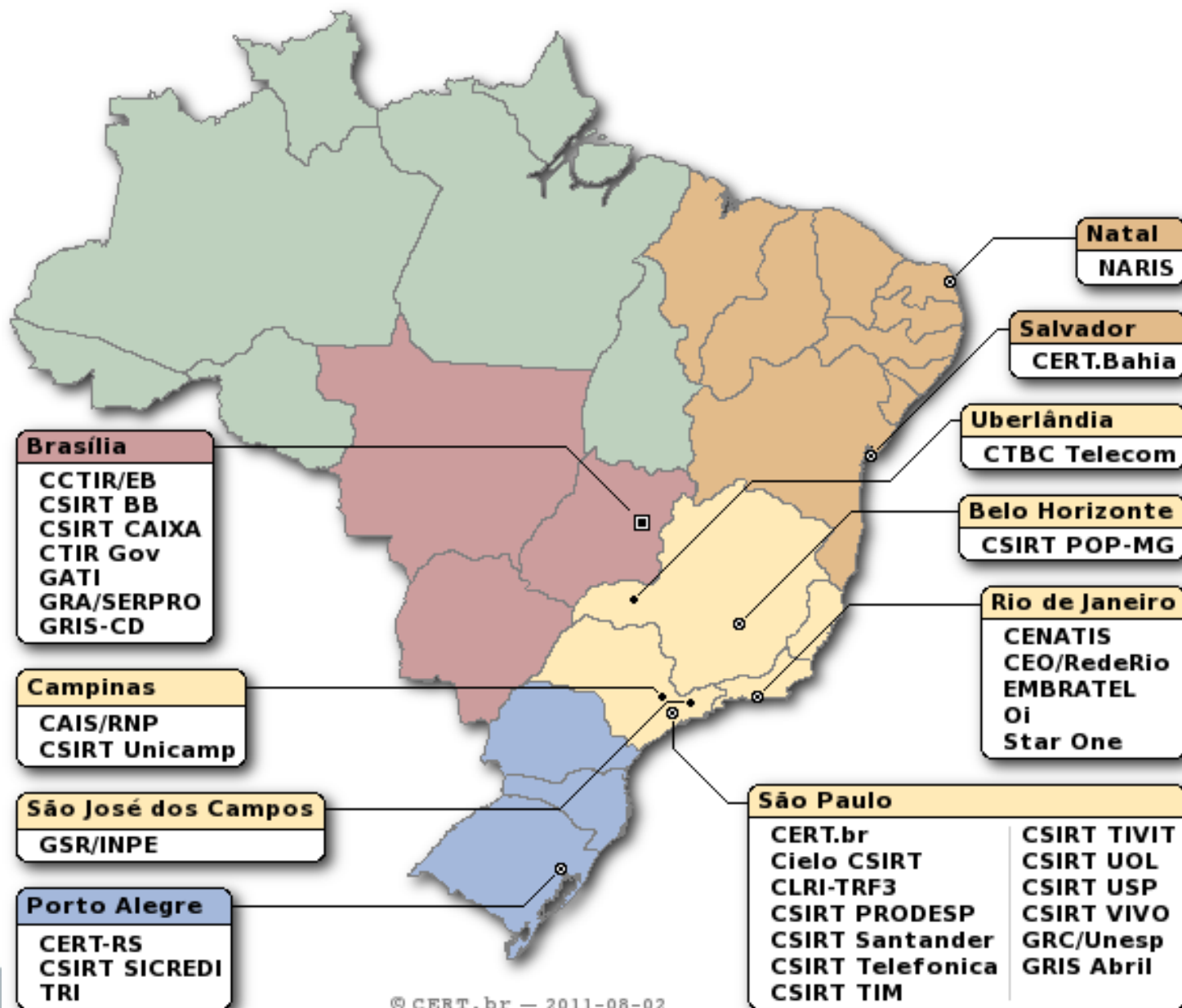


CERT.br: Incidentes Reportados (por dia da semana)





# Csirts no Brasil

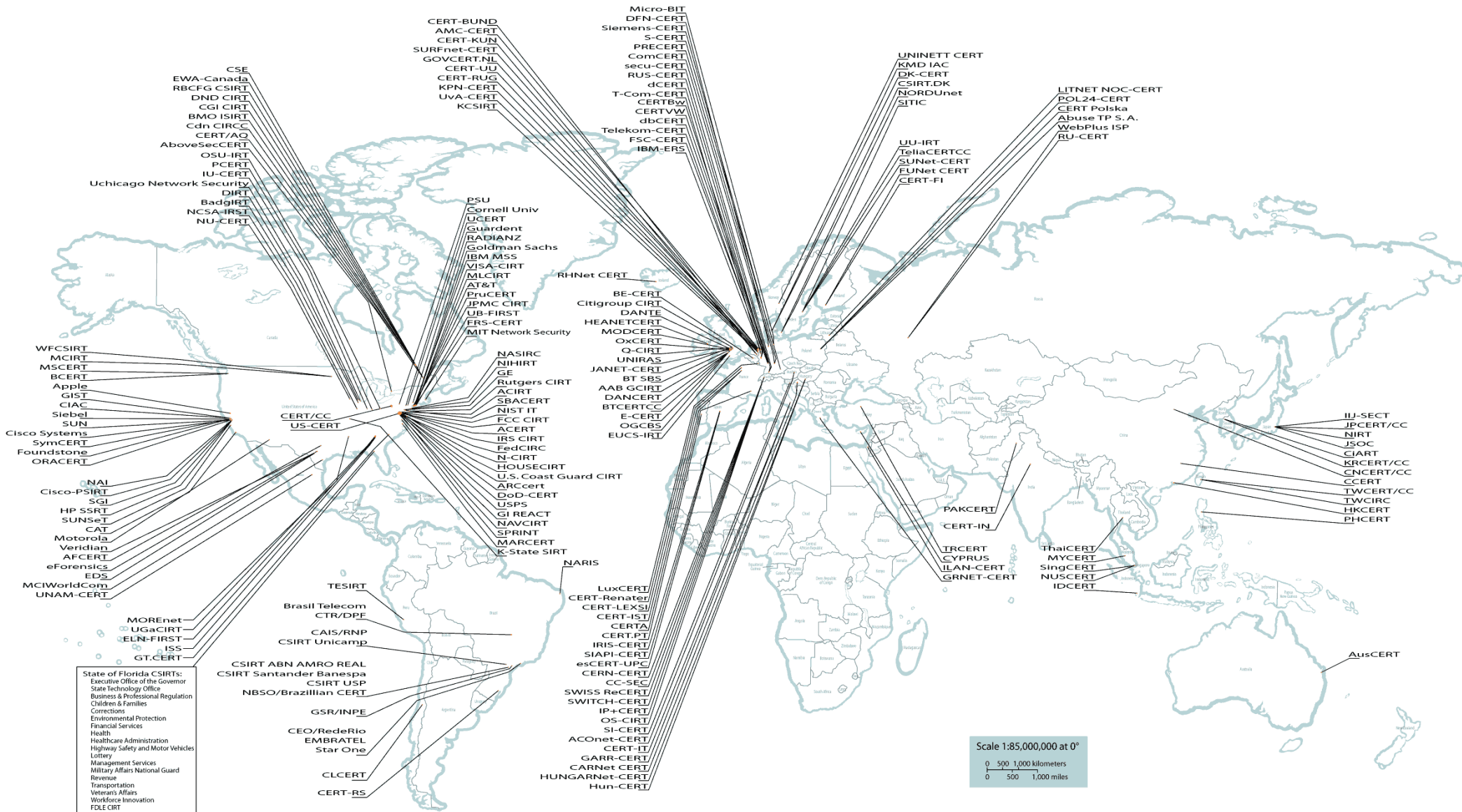


# Csirts no Mundo - FIRST



Incident Response Teams Around the World

International cooperation speeds response to Internet security breaches.



State of Florida CSIRTs:  
Executive Office of the Governor  
State Technology Office  
Business & Professional Regulation  
Children & Families  
Corrections  
Environmental Protection  
Financial Services  
Health  
Healthcare Administration  
Highway Safety and Motor Vehicles  
Lottery  
Management Services  
Military Affairs National Guard  
Revenue  
Transportation  
Veterans Affairs  
Workforce Innovation  
FDLE CIRT

# Framework Csirt



- **Processo Genérico e Adaptável;**
- **Difundido mundialmente;**
- **Apresenta como estabelecer e manter uma equipe de resposta a incidentes**
  - Analogia com corpo de bombeiros
- **Serviços que podem ser oferecidos**
  - 3 categorias
    - Reativos
    - Proativos
    - Gestão de qualidade

# Serviços



## Reactive Services



- + Alerts and Warnings
- + Incident Handling
  - Incident analysis
  - Incident response on site
  - Incident response support
  - Incident response coordination
- + Vulnerability Handling
  - Vulnerability analysis
  - Vulnerability response
  - Vulnerability response coordination
- + Artifact Handling
  - Artifact analysis
  - Artifact response
  - Artifact response coordination

## Proactive Services



- Announcements
- Technology Watch
- Security Audit or Assessments
- Configuration & Maintenance of Security Tools, Applications, & Infrastructures
- Development of Security Tools
- Intrusion Detection Services
- Security-Related Information Dissemination

## Security Quality Management Services



- ✓ Risk Analysis
- ✓ Business Continuity & Disaster Recovery Planning
- ✓ Security Consulting
- ✓ Awareness Building
- ✓ Education/Training
- ✓ Product Evaluation or Certification

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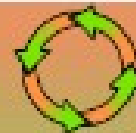


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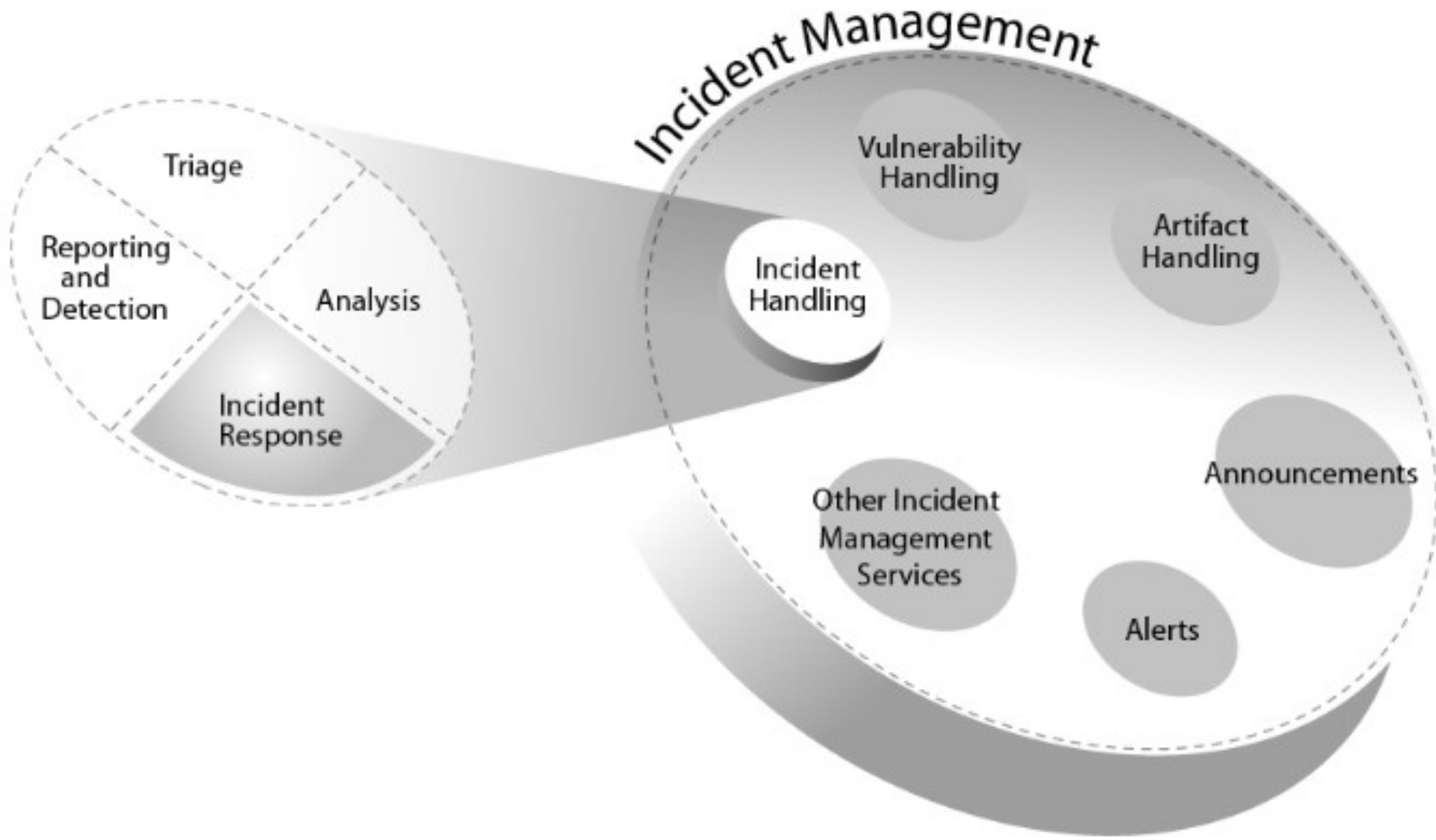
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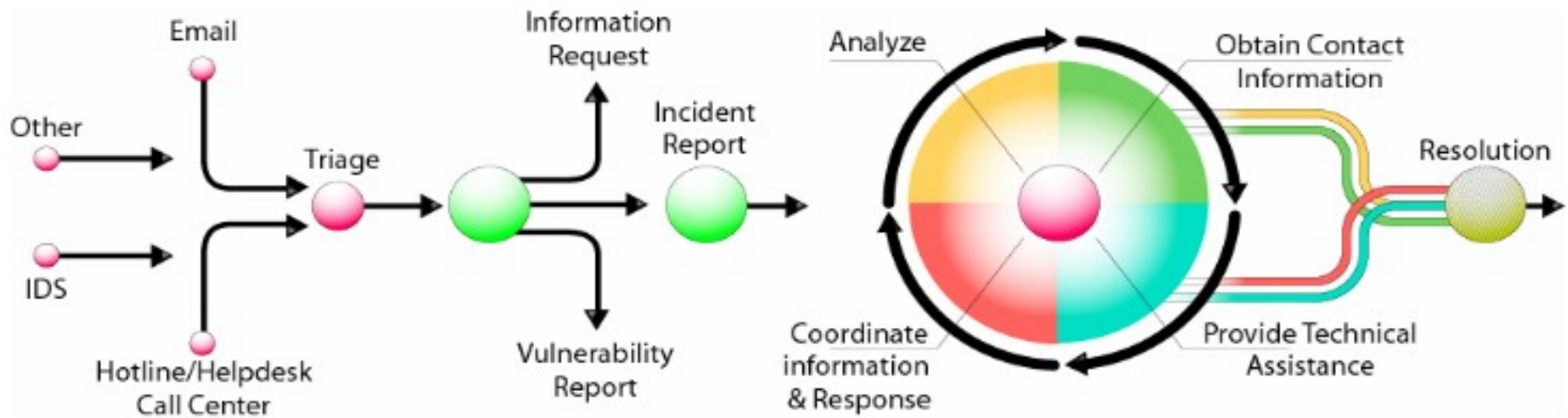
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# Incident Management





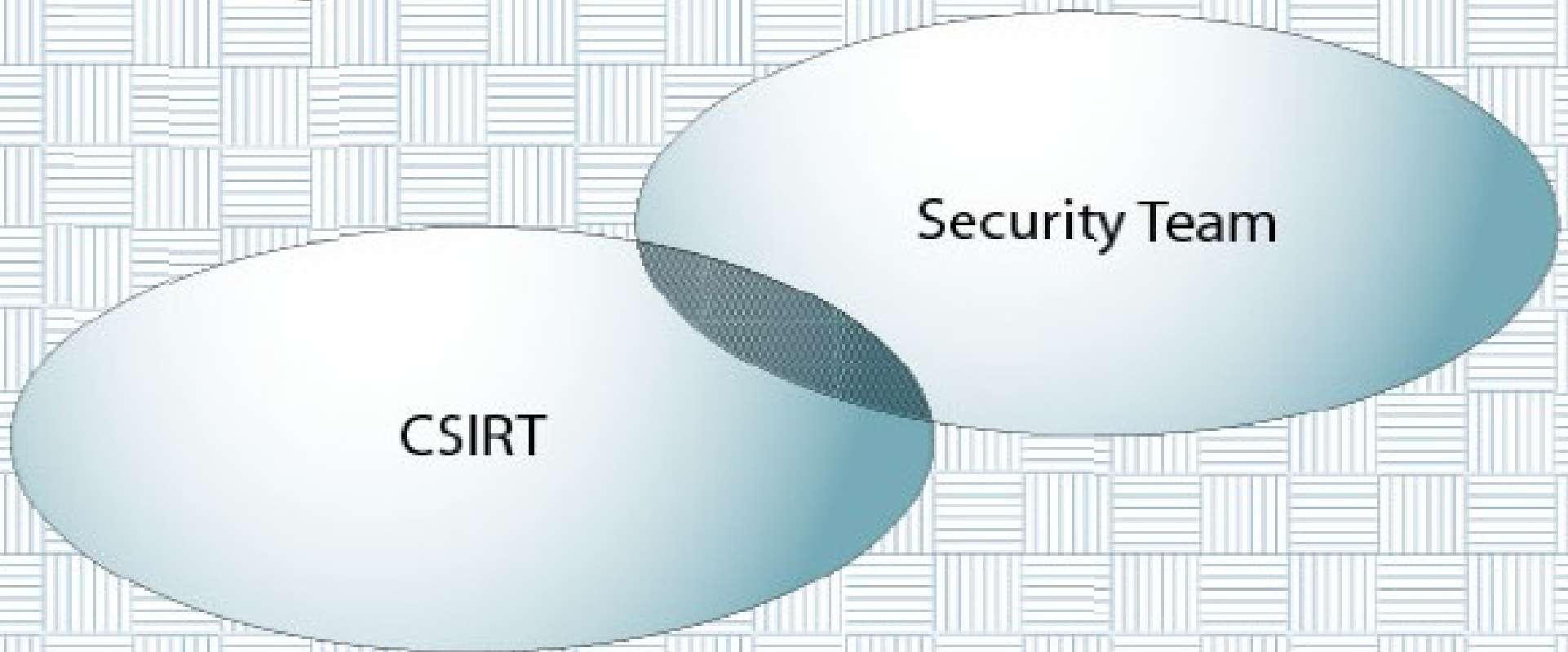
# Processo de Resposta a Incidentes



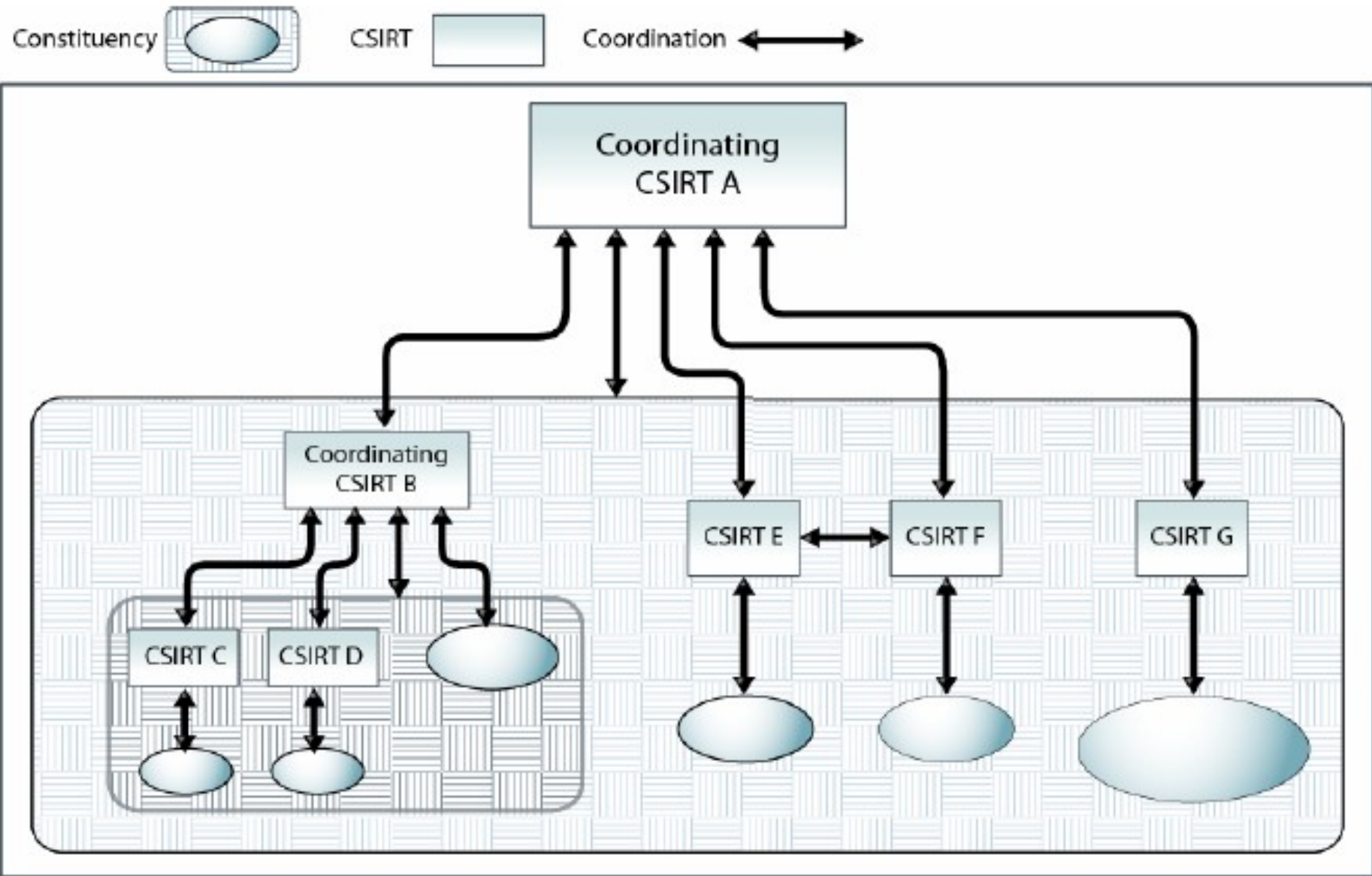
# Equipe



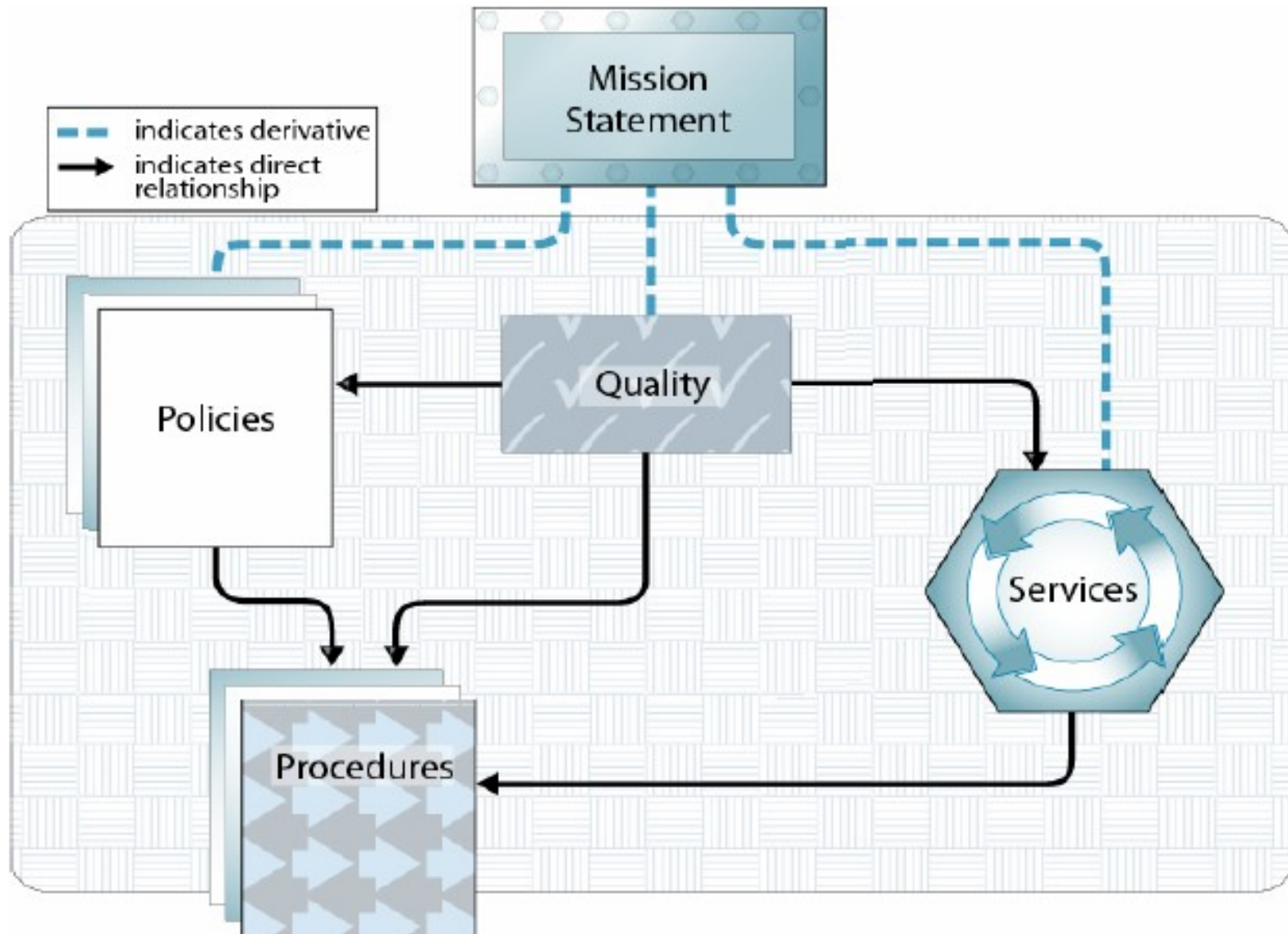
Parent Organization



# Relações entre CSIRTs



# Relação entre missão e serviços



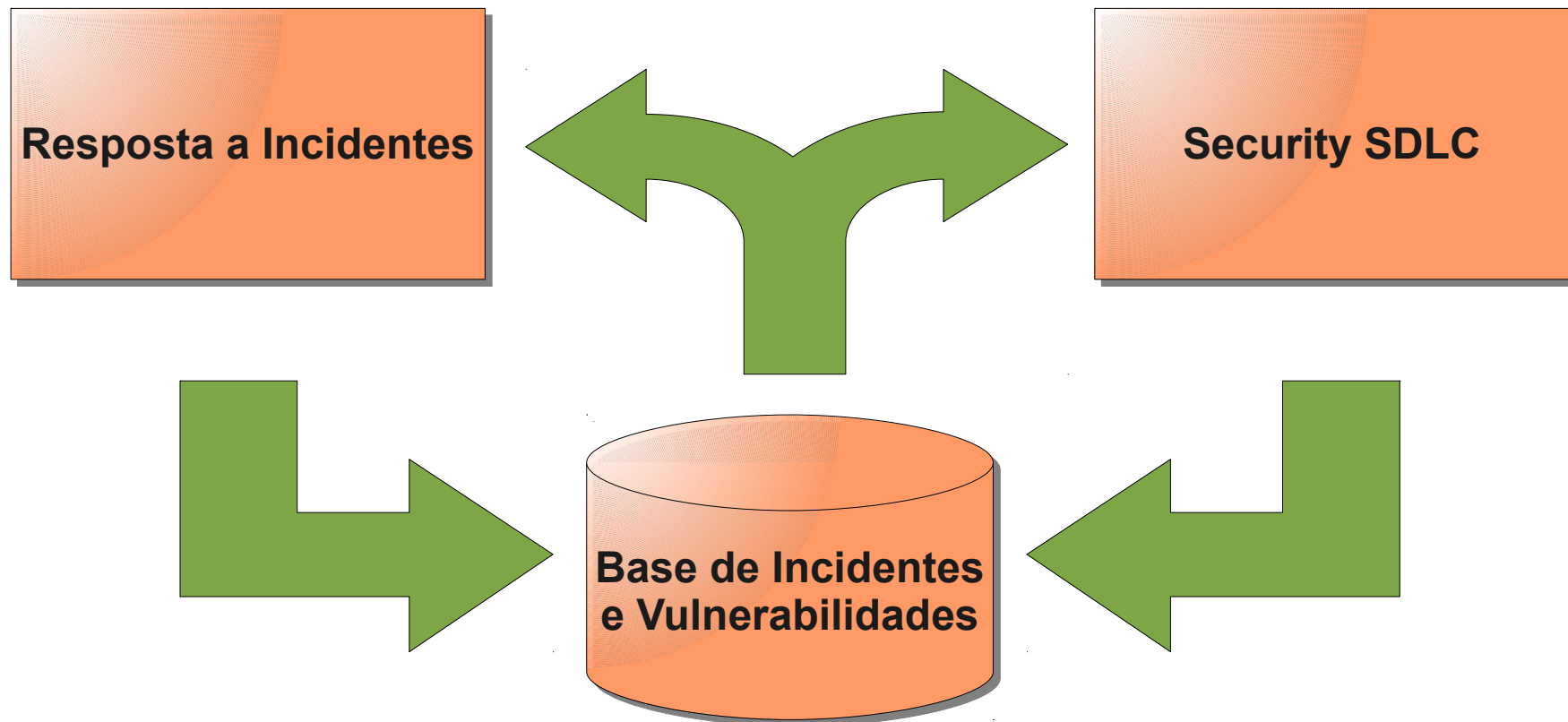
# Modelos Organizacionais



- **Coordenação**
- **Ad-hoc**
- **Centralizado**
- **Distribuído**
- **Distribuído com Coordenação Centralizada**

# Integração com SDLC

- **Resposta a Incidentes fornece subsídios que podem ser utilizados no início do SDLC;**





## Microsoft Security Response Center



HOME

WHAT WE DO

REPORT A VULNERABILITY

COMMUNITY COLLABORATION

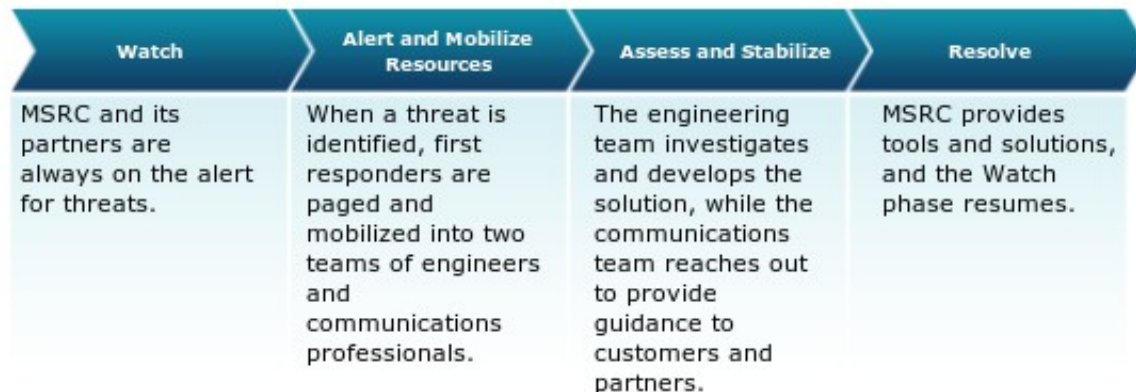
### Responding to Security Incidents



The Microsoft Security Response Center (MSRC) uses Microsoft's worldwide Software Security Incident Response Process (SSIRP) to understand security incidents quickly, and then investigate, analyze, and resolve those incidents. Security incidents are situations that arise when malicious users exploit vulnerabilities. The MSRC provides customers with the necessary information, guidance, mitigation steps, and tools to react appropriately.

#### Software Security Incident Response Process (SSIRP)

The SSIRP is defined by four phases:



### Security Update Guide

The Security Update Guide was created to help IT professionals better understand and use Microsoft security release information, processes, communications, and tools. [Check out the summary](#) or [download the Guide now](#).



### Related Links



[Releasing Security Updates, Bulletins, and Advisories](#)

[Conducting Technical Investigations](#)

## IBM Product Security Incident Response

Public Blogs

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### ▼ Vulnerability severity ratings

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[Medium-severity](#)

[High-severity](#)

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[Middleware \(WebSphere\)](#)

[Business Analytics](#)

[IBM Collaboration Solutions \(Lotus\)](#)

[IBM Security Systems](#)

[IBM System Storage](#)

[IBM Power Systems](#)

[IBM System x](#)

[IBM Systems Software](#)

## IBM Product Security Incident Response Blog

This page contains important information regarding security vulnerabilities that may affect IBM products and solutions. IBM PSIRT follows the NIST guidelines for determining the severity rating of the reported vulnerability - see "[NVD Vulnerability Severity Ratings](#)" for details. Please use this information to take the appropriate actions.

In our effort to serve you better, we recommend that you subscribe to RSS feed for notification of future IBM Security Bulletins and advisories posted on this blog. The short URL for this blog is <https://www.ibm.com/blogs/PSIRT>

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### Security Bulletin: Potential security vulnerability when using Web based applications on IBM WebSphere Application Server due to Java HashTable implementation vulnerability (PM53930) (CVE-2012-0193)

IBM PSIRT | Tuesday 4:53 PM | Tags: [websphere](#) [psirtmedium](#) [java](#) [psirtaim](#)

[Comments \(0\)](#) | [Visits \(104\)](#)

IBM WebSphere Application Server is susceptible to a potential denial of service condition when using Web based applications due to a JavaHashTable implementation vulnerability. CVE(s): CVE-2012-0193 Affected product(s): IBM WebSphere Application Server Affected version(s): 6.0, 6.0.0.2,

### ▼ Resources

[→ IBM Secure Engineering Practices](#)

[→ About IBM PSIRT](#)

[→ IBM PSIRT Process](#)

[→ Report Security Issue](#)

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- [Vulnerability Analysis](#)
- [Function Extraction \(FX\)](#)

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- [CERT Coordination Center](#)
- [CERT/CC Blog](#)
- [US-CERT Vulnerability Notes Database](#)
- [Vulnerability Disclosure Policy](#)
- [Courses](#)
- [Build Security In](#)

**US-CERT**  
[www.us-cert.gov](http://www.us-cert.gov)

## Secure Coding

Easily avoided software defects are a primary cause of commonly exploited software vulnerabilities. CERT staff has observed, through an analysis of thousands of vulnerability reports, that most vulnerabilities stem from a relatively small number of common programming errors. By identifying insecure coding practices and developing secure alternatives, software developers can take practical steps to reduce or eliminate vulnerabilities before deployment.

As part of the CERT Secure Coding Initiative, members of the Secure Coding team work with software developers and software development organizations to reduce vulnerabilities resulting from coding errors before they are deployed. We strive to identify common programming errors that lead to software vulnerabilities, establish standard secure coding standards, educate software developers, and to advance the state of the practice in secure coding.

### Areas of Work

#### Secure Coding Standards

The CERT Program is working with the software development and security communities to develop standards for commonly used programming languages. We

## Podcasts and Videos

ROBERT C. SEACORD | senior vulnerability analyst - CERT/CC

Secure Coding Initiative: Project - 12.02.2008 - Featuring Robert S

# Casos de Sucesso do SERPRO



- **Sem infecções em larga escala desde Agobot (2005);**
- **Resistência ao Conficker;**
- **Resistência aos ataques de DDOS em 2011;**
- **Nenhuma invasão aos sítios desenvolvidos pelo SERPRO e sistemas críticos durante os ataques de 2011;**
- **Assinatura do IDS SNORT, capaz de detectar o Ultrasurf, distribuída na comunidade internacional;**



O fator humano é fundamental.

Nenhuma tecnologia foi capaz de substituir o Analista



Obrigado!

[daniel.melo@serpro.gov.br](mailto:daniel.melo@serpro.gov.br)

# Bibliografia

- **Secure Coding – Principles and Practices. Mark G. Graff, Kenneth Wyk. Editora O'reilly.**
- **CSIRT – Handbook - [www.cert.org](http://www.cert.org).**