



VOTING



Election Workflow Automation



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e -Voting Workshop 2006
August 2nd to 4th, 2006

Agenda

- Introduction
- Dominion and e-Voting
- Election Cycles and Events
- Dominion Democracy Suite™
 - Elector Management
 - Election Event Management
- Traditional Voting
- Remote Voting
- Current Work - Canadian and US Elections
- Q&A



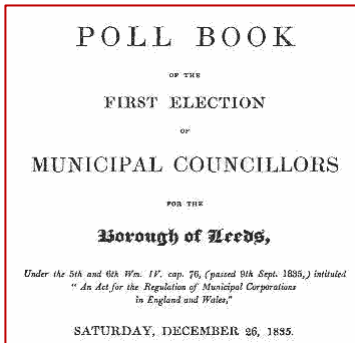
Introductions



- Main office - Toronto, Canada.
- Offices in Montreal, Calgary, Chicago, Ohio, Belgrade.
- Primary focus – Canada and USA (for now)
- R&D – 75%, PhD and M.Sc. – 50%
- National Level (Canada)
 - 308 ridings, Everywhere Voting™
- Provincial Level
 - Real-time voter strike-offs
 - Elector management
 - Provincially approved tabulation equipment
- Municipal Level
 - Coast to coast – British Columbia, Alberta, Ontario, Quebec, New Foundland
 - Tabulation, electronic remote voting, vote by mail
 - Real-time voter strike-offs
 - Elector management
 - Variety of election services
- Partners – Microsoft, Cisco, Bell&Howel, DMTII, MPAC, Automark, Canada Post, Datafix, ...



Dominion and e-Voting



Poll-book, UK, 1885



Ballots Casting

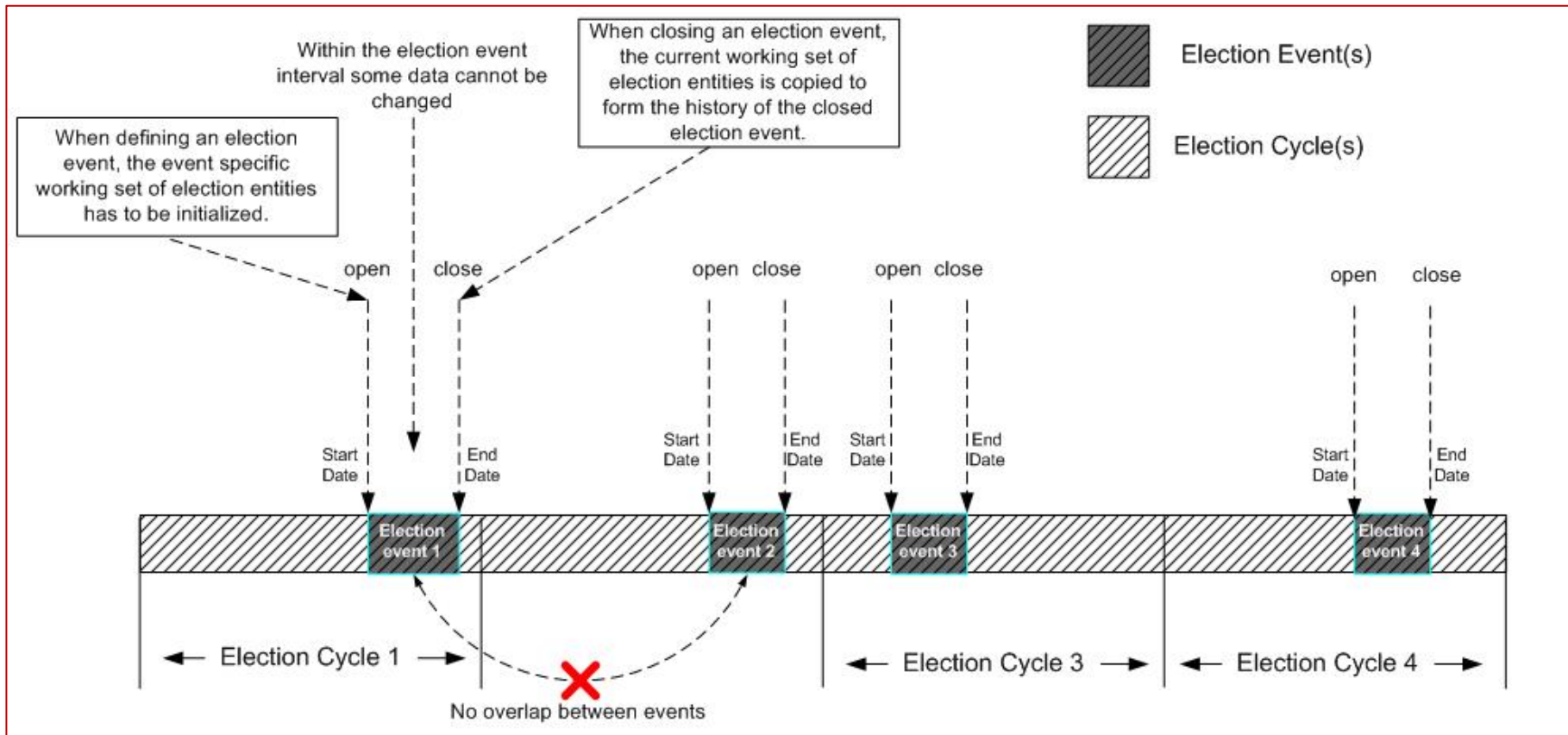


Election Results,
Argentina, 1900

- e-Voting \equiv Internet Voting (usually)
- If 'e' means electronic than e-Voting means much more than Internet voting
- In essence we have tried to automate and computerize every aspect of the election process
- Internet Voting is just a subset of the Remote Voting together with Vote by Mail, telephony voting, fax-back voting, etc.
- Traditional voting will be in use for years.
- This is why we have worked on integrated, automated election workflow – Democracy Suite™.



Election Cycles & Election Events



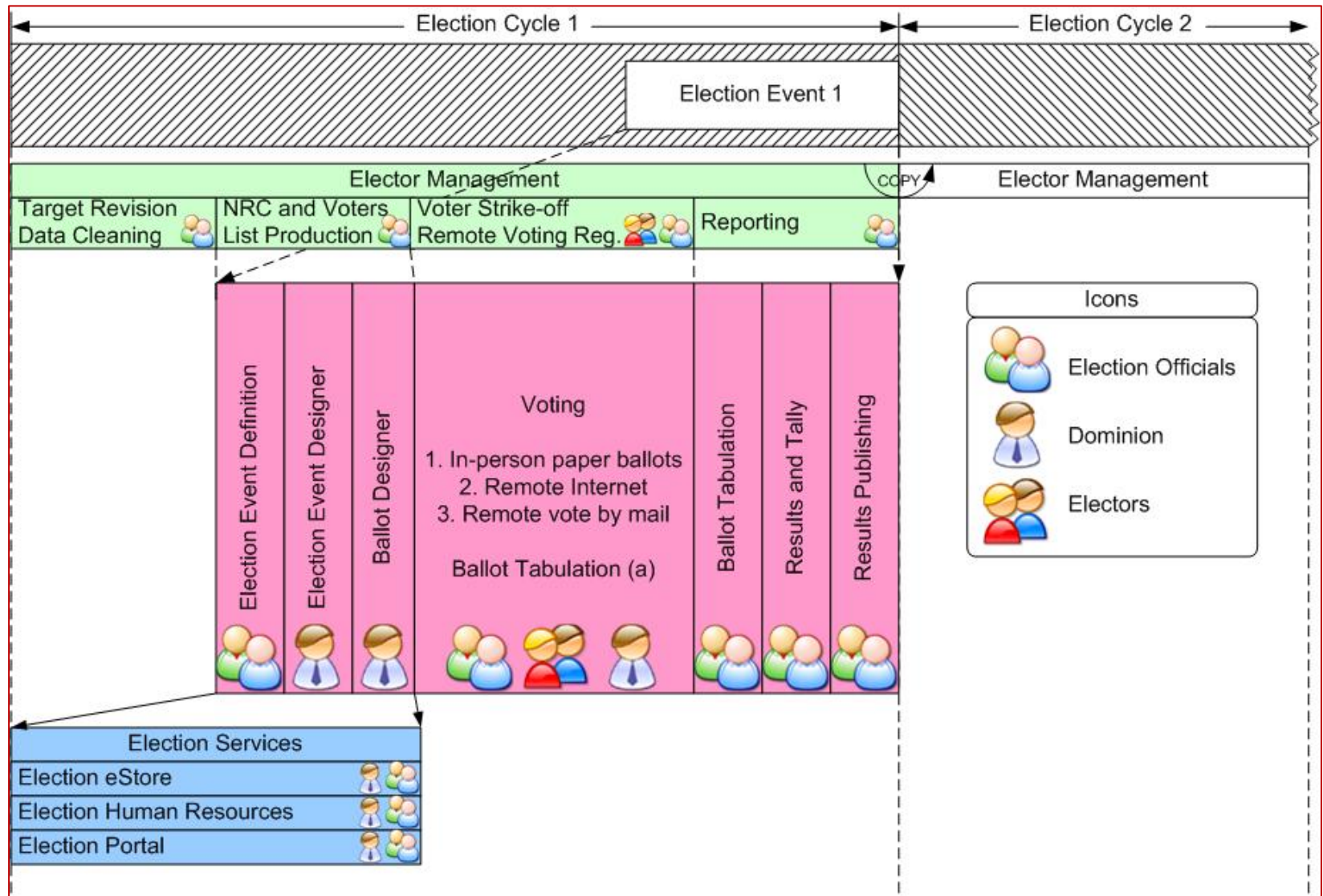
Dominion Democracy Suite™

Variety of
products and
services

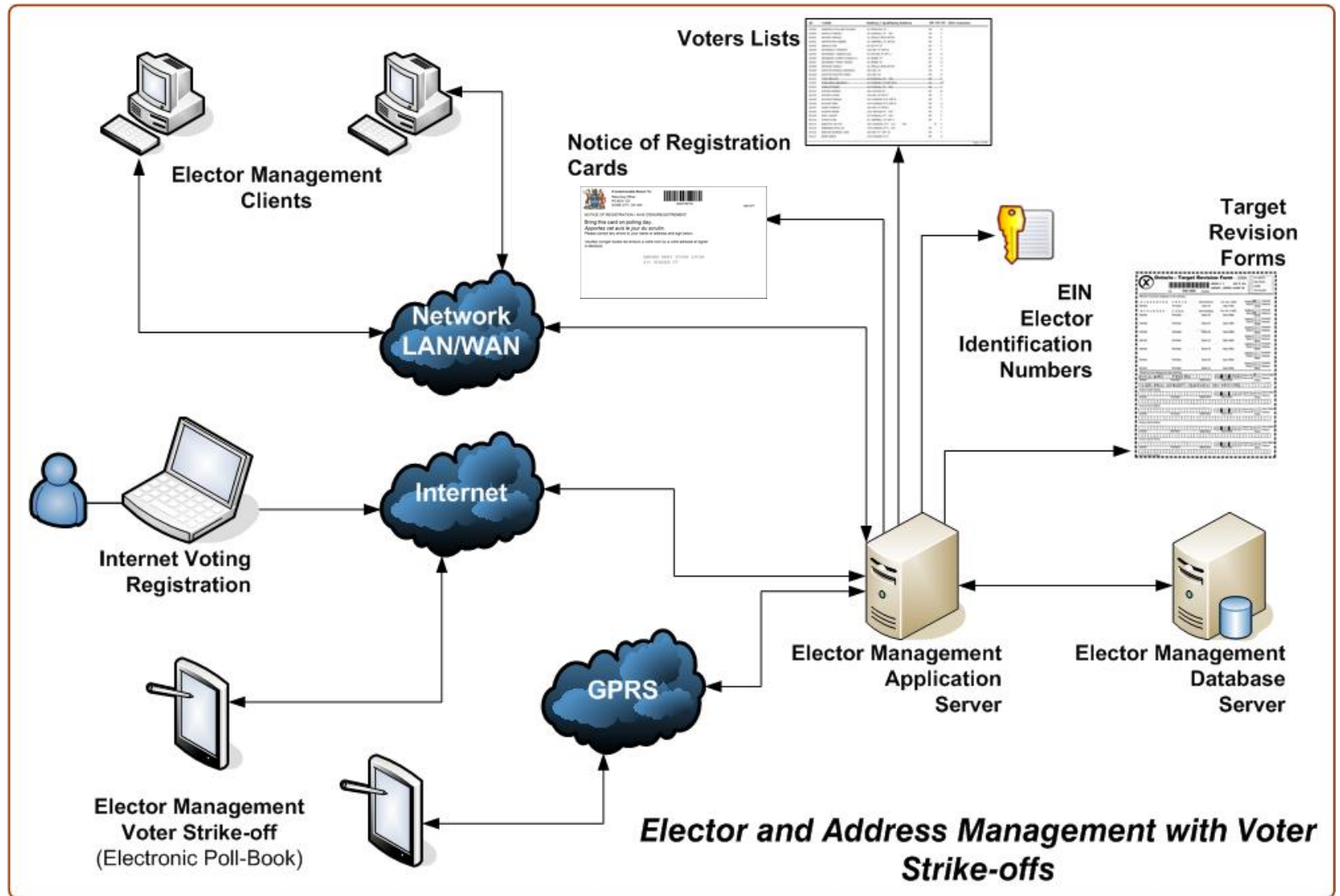
- Everywhere Voting™
- Elector Management
- Real-time Voter Strike-offs
- Election Event Management
 - Election Event Definition
 - Election Event Designer
 - Ballot Designer
 - Results and Tally
- Ballot Tabulation
- Remote Voting – Internet, mail, fax
- Results Publishing
- Election Store (www.theelectionstore.com)
- Election Human Resources
- Election Customer Portal



Dominion Election Workflow



Elector Management



Elector Management

Create &
manage your
own
permanent list
of electors

- Interface with external data
- NRC (notice of registration cards) creation
- Cleanse data
 - Cleansing of elector and address data
 - Data comparisons & resolutions
- 'Where should I vote?'
- Elector list maintenance
- Updated elector lists
- Remote voting support
- Real-time voter strike-off support
- Extensive reporting capability



Elector Management 1

Electoral Management

Main View Settings Help

Activities Workbench

General

Electoral

Voters Lists and N...

Data Quality

Remote Voting

Area Management

Reporting

Administration

Search

Quick Search Advanced Search

Search by ID Search by Last Name

Elector ID Last Name Adams

Search Reset

New Delete Current Create Report

Elector ID	Last Name	First Name	Middle Name	Address	Poll	Voting Status	Voting Channel
0000536764	ADAMS			417 MONTCA	S18.0	Not voted	Paper Ballot
0000433357	ADAMS	ALANA	CHRISTINE	871 CUMBERL	S16.0	Not voted	Paper Ballot
0000440097	ADAMS	ALICE		1042 ORIOLE	S13.0	Not voted	Paper Ballot
0000449808	ADAMS	ALICE	MAUREEN	993 HATFIEL	S13.0	Not voted	Paper Ballot
0000751063	ADAMS	ALMA		243 MILROY	S23.0	Not voted	Paper Ballot
0000558375	ADAMS	ANDREW	THOMAS	2504 KEITEL	S27.0	Not voted	Paper Ballot
0000555696	ADAMS	BARRY	WILLIAM	627 WALKERF	S12.0	Not voted	Paper Ballot
0000472998	ADAMS	BERT		574 ARNDON	S10.0	Not voted	Paper Ballot
0000390309	ADAMS	BEVERLY	EILEEN	699 WHITAKE	S20.0	Not voted	Paper Ballot
0000287620	ADAMS	BILL		899 CLONSLI	S20.0	Not voted	Paper Ballot

Electoral Management

Main View Settings Help

Activities Workbench

Data Quality

Look for Last Name 8 Find View Search results

General

Electoral

Voters Lists and NRCs

Data Quality

Remote Voting

Area Management

Reporting

Administration

Last Name	Created
BAKER	07/22/2006
BAKER	07/22/2006
BARBER	07/22/2006
BARCLAY	07/22/2006
BARRIFFE	07/22/2006
BARRY	07/22/2006
BARTLEY	07/22/2006
BASEL	07/22/2006
BATEMAN	07/22/2006
BATEMAN	07/22/2006
BATEMAN	07/22/2006
BEATTY	07/22/2006
BEHRENS	07/22/2006
BELL	07/22/2006
BELL	07/22/2006
BELL	07/22/2006
BELLAMY-MISSIOS	07/22/2006

Electoral Management

Main View Settings Help

Activities Workbench

Area Management

General

Remote Voting

Area Management

Reporting

Administration

Search

Quick Search Advanced Search

Search by ID Search by Last Name

Elector ID Last Name Adams

Search Reset

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Elector ID	Last Name	First Name	Middle Name	Address	Poll	Voting Status	Voting Channel
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0000555696	ADAMS	BARRY	WILLIAM	627 WALKERF	S12.0	Not voted	Paper Ballot
0000472998	ADAMS	BERT		574 ARNDON	S10.0	Not voted	Paper Ballot
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0000287620	ADAMS	BILL		899 CLONSLI	S20.0	Not voted	Paper Ballot

Electoral Management

Main View Settings Help

Activities Workbench

Area Management

General

Remote Voting

Area Management

Reporting

Administration

Search

Quick Search Advanced Search

Search by ID Search by Last Name

Elector ID Last Name Adams

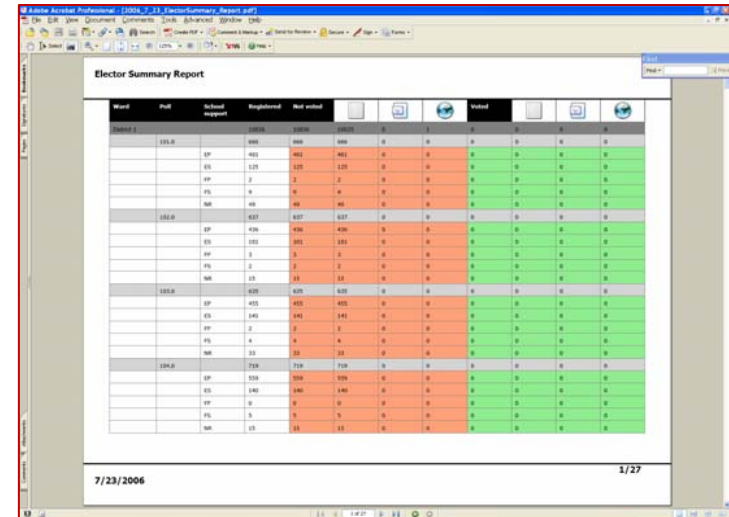
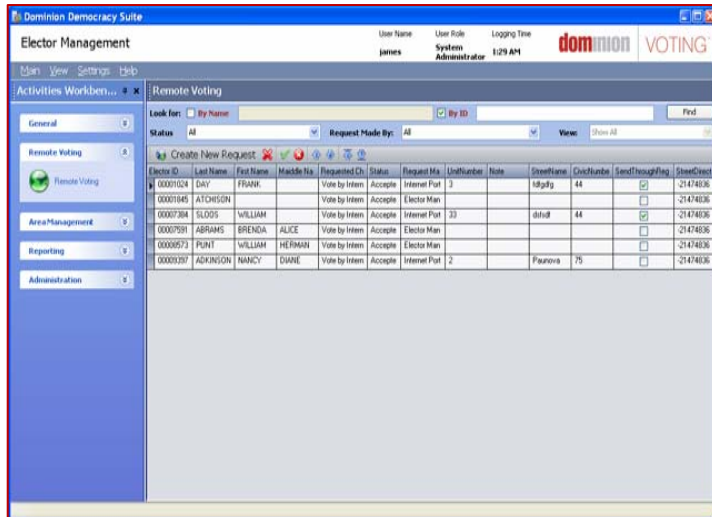
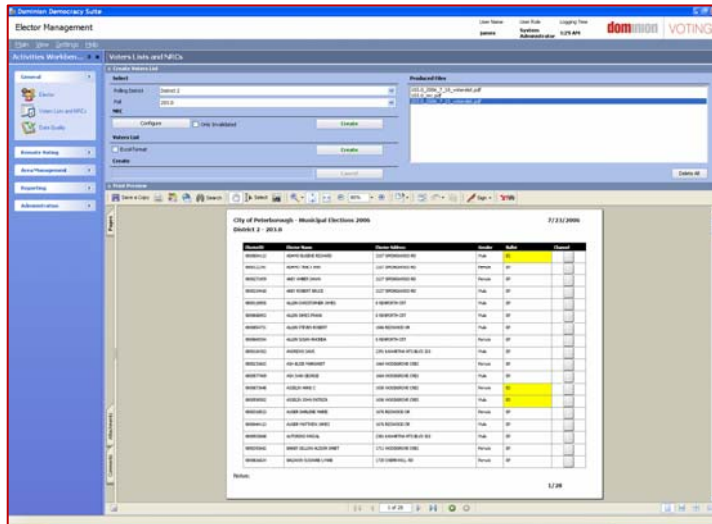
Search Reset

New Delete Current Create Report


Elector ID	Last Name	First Name	Middle Name	Address	Poll	Voting Status	Voting Channel
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0000287620	ADAMS	BILL		899 CLONSLI	S20.0	Not voted	Paper Ballot



Elector Management 2



Where Should I Vote?

 **City of Peterborough**
2006 General Local Election

dominion VOTING™

On Line Services - Elector Services


Welcome, John Smith

Please select a voting method

[Vote over the Internet](#)

[Vote in person \(see your polling locations\)](#)

For more detailed instructions, download [Quick Start Guide](#) (PDF)
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 **City of Peterborough**
2006 General Local Election

dominion VOTING™

On Line Services - Elector Services

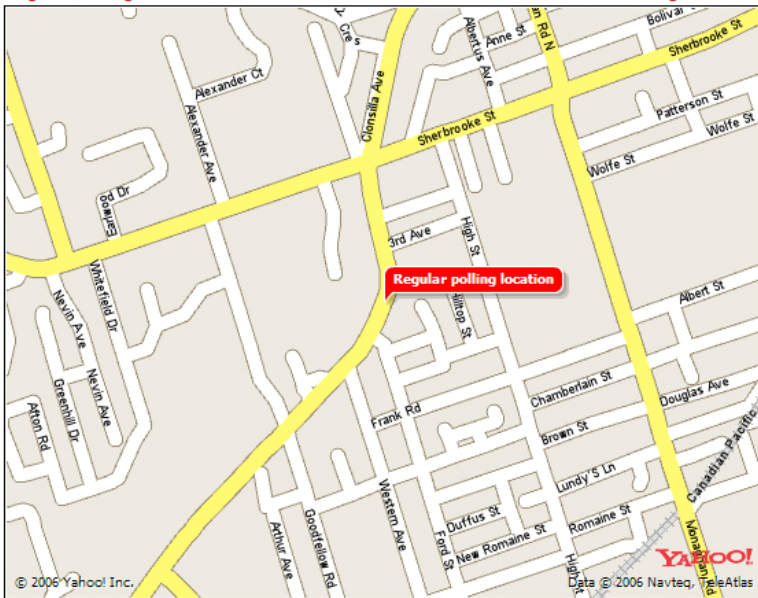
Welcome, John Smith

Please select a voting method

[Vote over the Internet](#)

Regular Polling Location

Advanced Polling Location



© 2006 Yahoo! Inc. Data © 2006 Navteq, TeleAtlas

For more detailed instructions, download [Quick Start Guide](#) (PDF)
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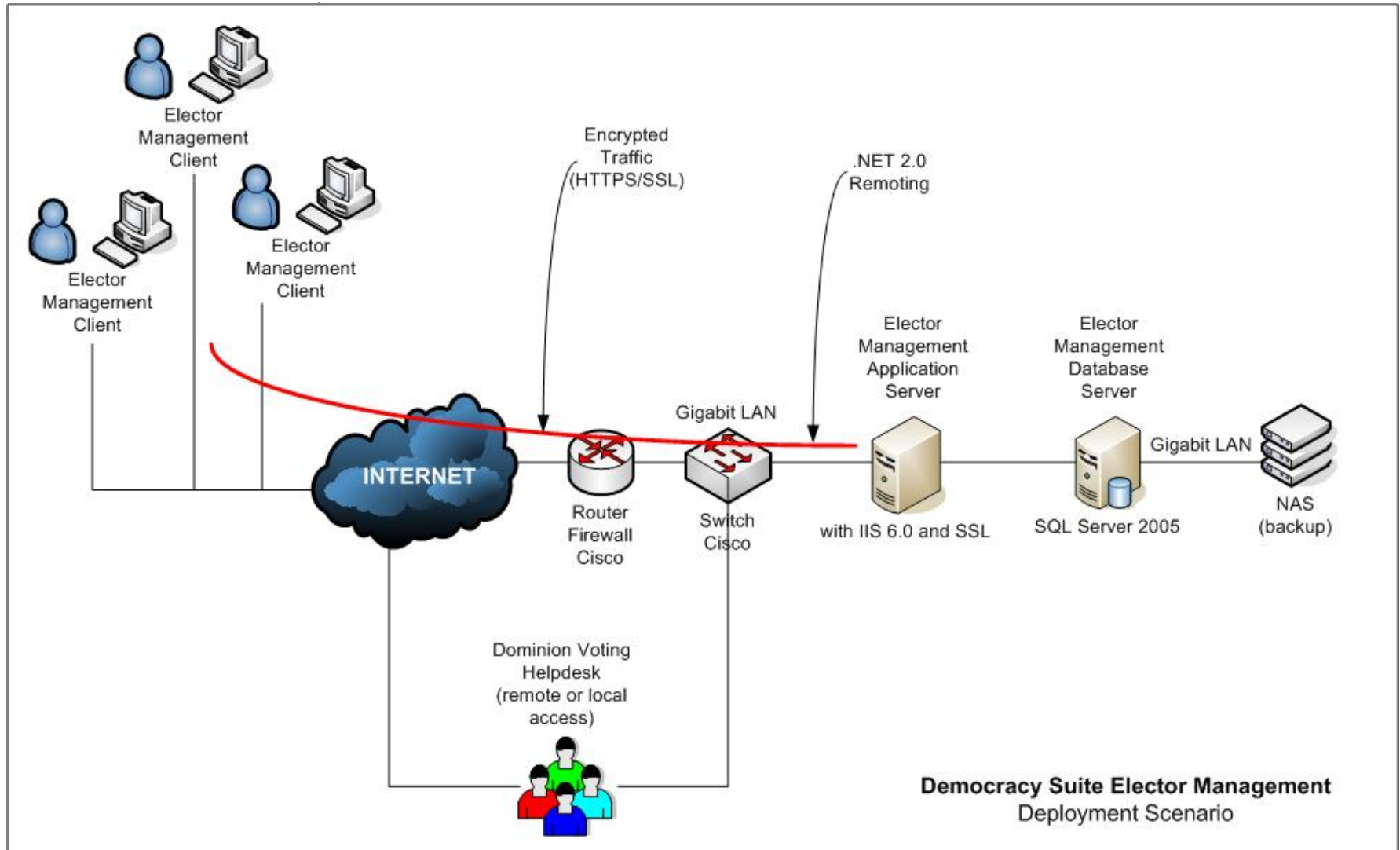
Real-time voter strike-offs

The only
practical
solution to
everywhere
voting

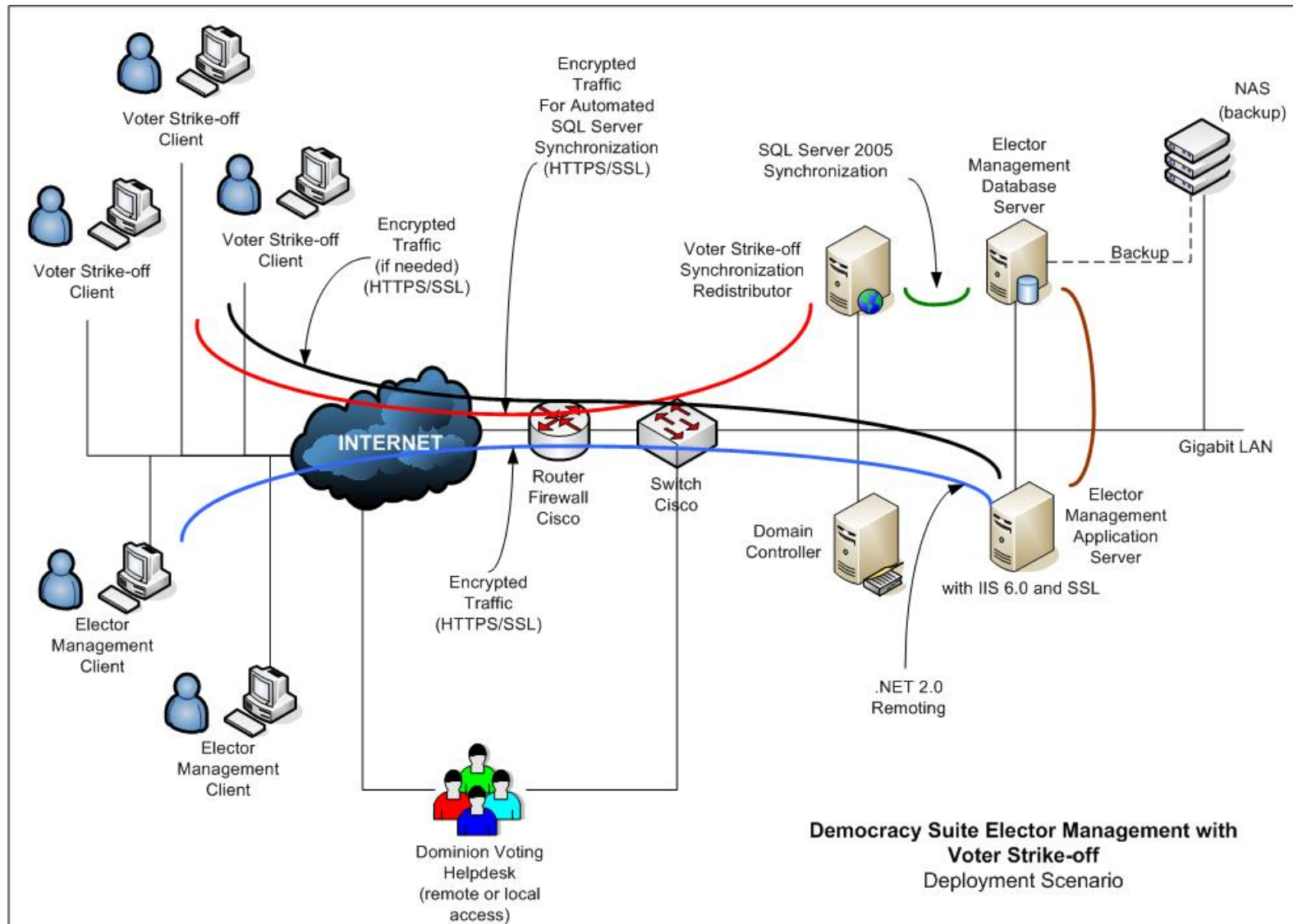
- Every name on every voter list
- Real-time poll connectivity
- Minimize scope of fraud
- Client-server database synchronization
- Integrated with Elector Management
- Electronic poll-book



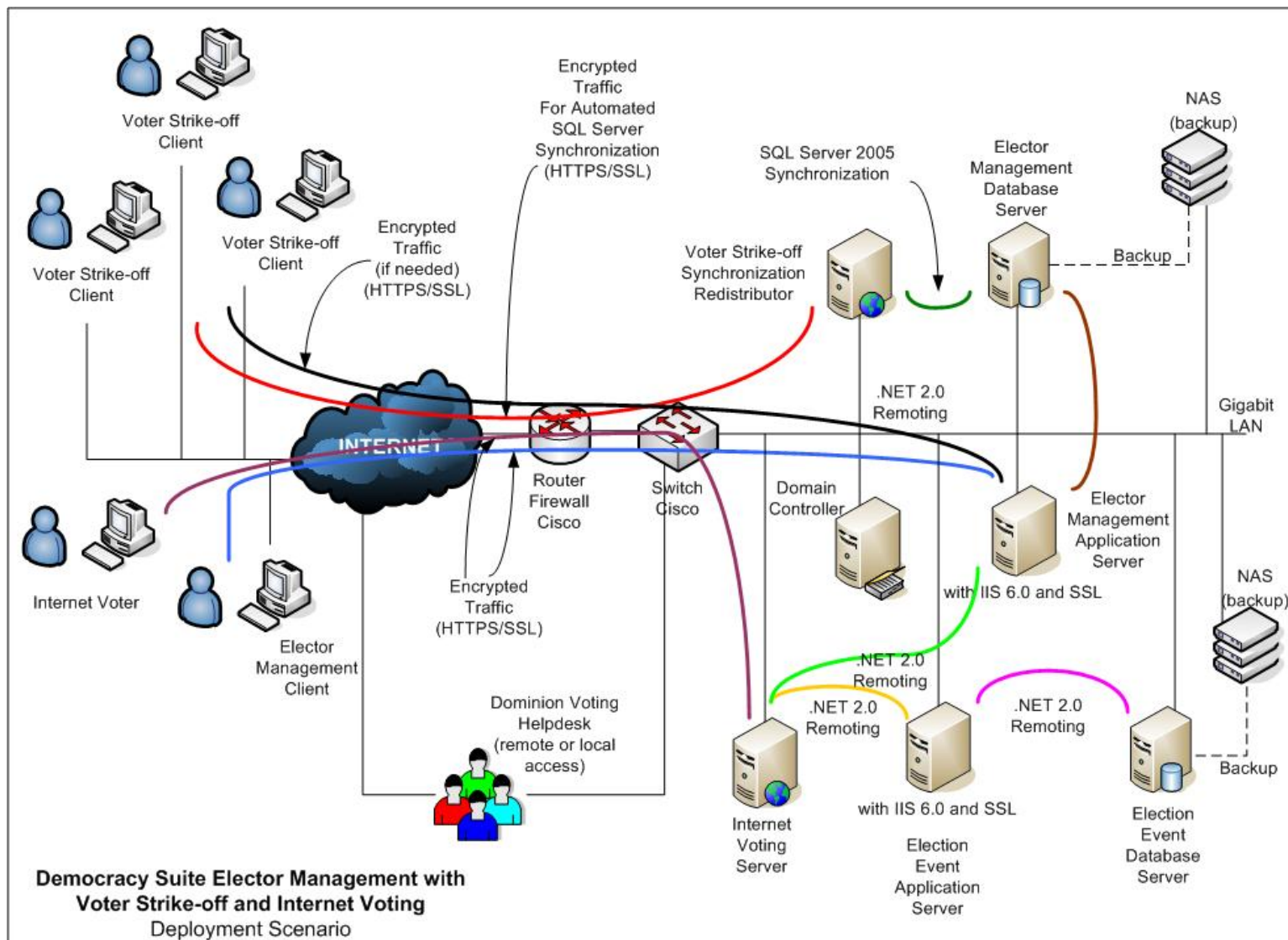
Elector Management Deployment 1



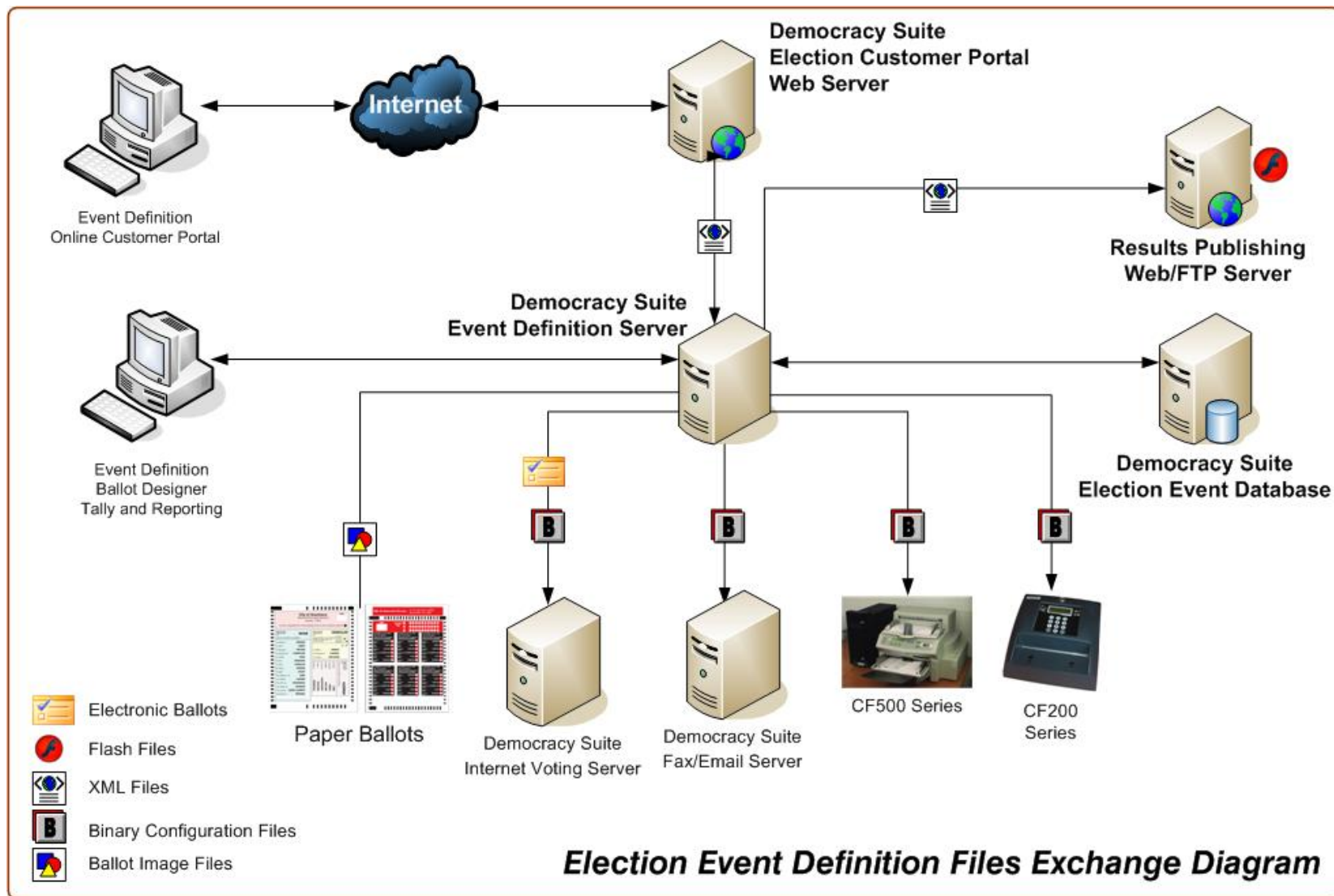
Elector Management Deployment 2



Elector Management Deployment 3



Election Event Management



Election Event Definition

On-line service

Allow election officials to:

- Election event
- Geography information
- Polling stations
- Contests
- Candidates
- Ballots
- Export XML

The screenshot shows the 'Election Event Definer' web application running in Microsoft Internet Explorer. The interface includes a navigation tree on the left, a main form area for defining election events, and a table for selecting wards.

Navigation Tree:

- Mayor at large
- Regional Councillor Ward
- Ward 1 Councillor
- Regional Councillor Ward
 - Androutsos
 - McKinstry
- English Public School Trustee
 - Maley
 - Chaudhry
 - Braun
- English Separate School Trustee
 - Wong
- French Separate School Trustee
- French Public School Trustee
- Ward 2 Councillor
- Ward 3 Councillor
- Referendum Question

Main Form:

Options Help

Welcome

Name (as it will be displayed on the ballot): English Separate School Trustee

Description: English Separate School Trustee

Candidate Management:

Vote for: 1

Add Candidate

Type: Trustee

Subtype (trustee only): English Separate

Select Wards for this Contest: ☐ Select All:

Ward Name	
Ward 1	<input checked="" type="checkbox"/>
Ward 2	<input checked="" type="checkbox"/>
Ward 3	<input checked="" type="checkbox"/>
Ward 4	<input checked="" type="checkbox"/>
Ward 5	<input checked="" type="checkbox"/>

Add New Contest **Apply**

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DISTRICT OF SQUAMISH

2005 General Local Election
Elections December 13, 2005

To vote, fill in the arrow ➡ next to your choice(s). Use this ➡
Use only the marking pen provided. To protect your voter privacy, insert ballot face down into voting machine. Do not fold the ballot.

Councillor	MAYOR	COUNCILOR	SCHOOL TRUSTEE
Vote for ONE (1) only	Vote for ONE (1) only	Vote for one more than TWO (2)	Vote for one more than THREE (3)
NORTH SUTHERLAND Steve PATTERSON ➡	Larry McLENNAN ➡ Hughson MRSAR ➡ Jean KASLOV ➡ Jeff McKENZIE ➡ Joan LAFRAMBOISE ➡ Gerry LEAHN ➡ Mike JENSEN ➡ Shawn KELLEN ➡ Bruce RAISER ➡ Jeff DAVIDSON ➡ Norman FENN ➡ Gerome L'ORSIDALE ➡ Fabrice HEINTZMAN ➡ Alexandre MERGIANIA ➡ Tom DODRACH ➡ Jim PETERS ➡ <small>(Marked by the voter)</small>	Archie BEAUBIEN ➡ Gary WALLACE ➡ Andrew MICHALOSKIE ➡ Steve PATTERSON ➡ Rick PRICE ➡	

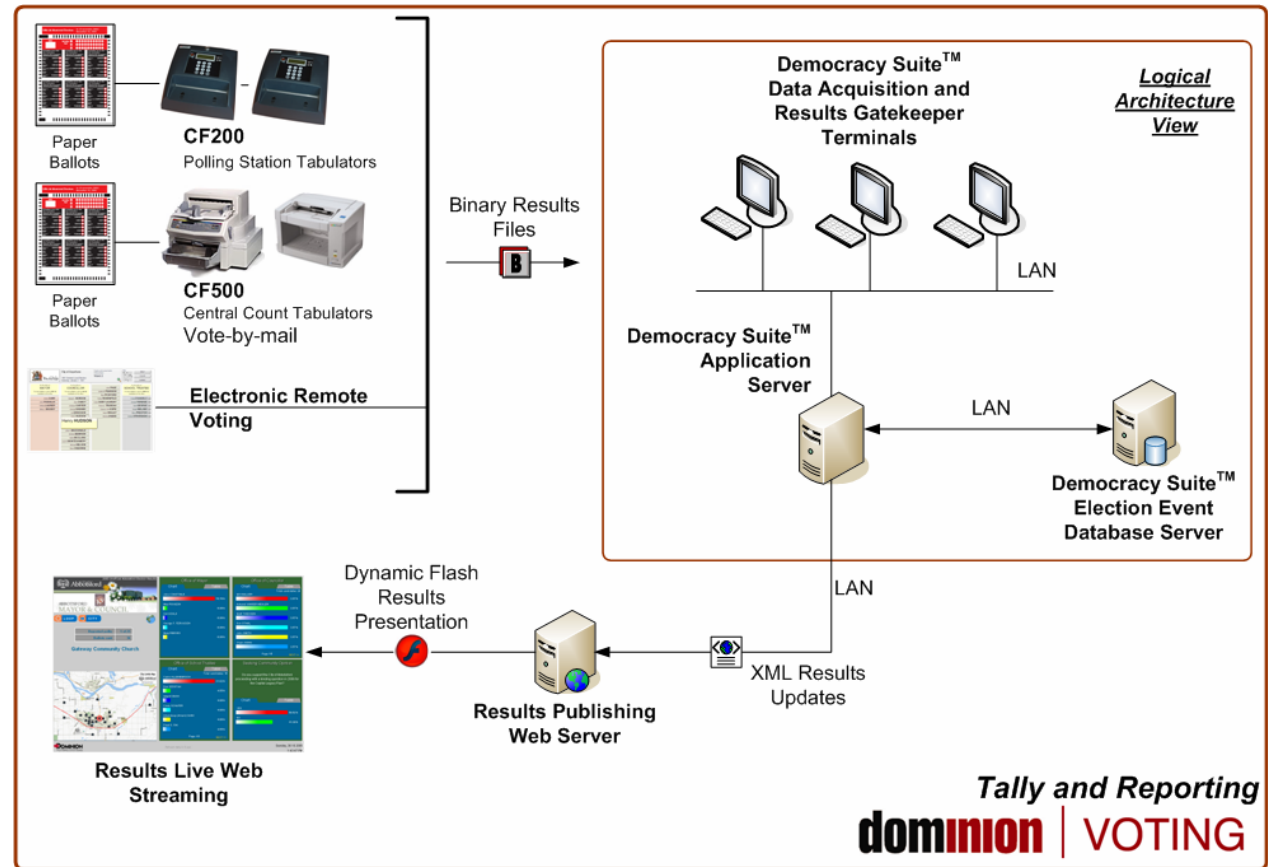
- [illegible]

dominion VOTING

Results Tally and Reporting

Single point gateway to the public

- Acquire results
 - From all voting locations
 - From all voting channels
- Release results
 - Set check flags for sanity checks
 - May be configured to withhold release of any poll result
 - Automatically releases reporting files to FTP site
- Results auditing
 - Every/any ballot image can be inspected



Election Results Publishing

Results go
everywhere
you need them
to go

- Election results are automatically reported to any public forum
 - City website, local news media
 - Council chambers
- Results transmitted in real time
- XML schema



Paper Ballots Tabulation

Decentralized
and
centralized
ballot
tabulation
solutions for
traditional
paper-based
voting

■ Poll Tabulation – CF200 Series



- High resolution image scanner
- Saves every ballot image
- Completely repeatable
- No restrictions ('X', "√", "←", "●")
- Integrated audio accessibility
- Ballot size up to A3, double sided

■ Central Tabulation – CF500 Series



- Same features as poll tabulation
- 6000 ballots per hour (actual)
- Very high throughput
- Ballot size up to A3, double sided



Accessibility

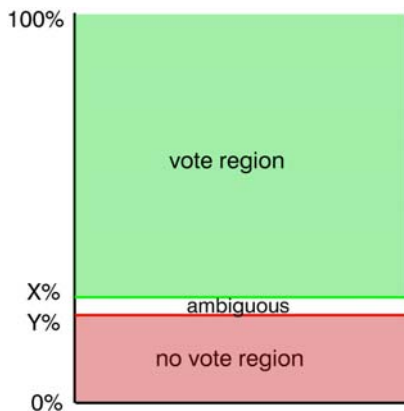
Universal
access is not
universal
suffrage

- Universal suffrage
 - (def) the right to vote, to all adults, without distinction as to race, sex, belief, or social status.
 - privileged men → all men → woman → Asians → native people → inmates → homeless (1867-2003)
- Universal access
 - The right to ***a private*** vote, to all adults, without distinction as to race, sex, belief, social status or ***physical ability***
 - Universal access to Canadians (2003)



Is the mark a vote?

Election
officials define
what should
be considered
as a vote



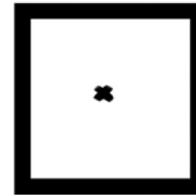
■ Is this a vote?



■ Is this a vote?



■ Is this a vote?



- Make the smallest mark you count as a vote (X%)
- Make the largest mark you don't count as a vote (Y%)



Ballot watermarking

City of Anywhere
General Municipal Election
January 1 1891

DRO *J.S.*

To vote, completely fill in the box(es) ☐ next to your choice(s), like this: ☒

BALLOT FOR THE OFFICE OF MAYOR		BALLOT FOR THE OFFICE OF COUNCILLOR	
Vote for only ONE (1) candidate		Vote for ONE (1) 1st choice & ONE (1) 2nd choice, as shown at right:	
1) Robert L.	BORDON	1) Miles J.	MASSEY
2) Jean	CABOT	2) Menelaus P.	O'DANIEL
3) Jacques	CARTIER	3) Clause	VON ESPIE
4) Samuel de	CHAMPLAIN		
5) James	COOK		
6) Leif	ERIKSSON		
7) John	FRANKLIN		
8) Henry	HUDSON		
9) Jake	JOLIET		
10) William L.M.	KING		
11) Wilfrid	LAURIER		
12) John A.	MacDONALD		
13) Lester B.	PEARSON		
14) Louis S.	SAINT-LAURENT		
15) Pierre E.	TRUDEAU		
<i>Nick Salvatore</i>			

BALLOT FOR THE OFFICE OF ALDERMAN
Vote for up to THREE (3) candidates

1) Emily	CARR
2) Jeanne	MANCE
3) Nellie	MCCLUNG
4) Lucy M.	MONTGOMERY
5) Mary	PICKFORD
6) Fanny	ROSENFELD

DRO: 2109

Office of Mayor: 0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,780
Vote for: *Nick Salvatore*

Office of Councillor: (805,0),(1,790),(0,0)
Vote for: Miles J. MASSEY (1st), Menelaus P. O'DANIEL (2nd)

Office of Alderman: 2,812,2,823,788,776
Vote for: OVER-VOTE

- Patented technology
- Every ballot is saved – paper or electronic
- Ballot signature contains information about:
 - Voting marks for every contest
 - Pixel counts
- Supports preferential voting
- Supports write-in candidates
- Useful for logic and accuracy (L&A) testing
- Key for unquestionable auditing
- Eliminates recounts



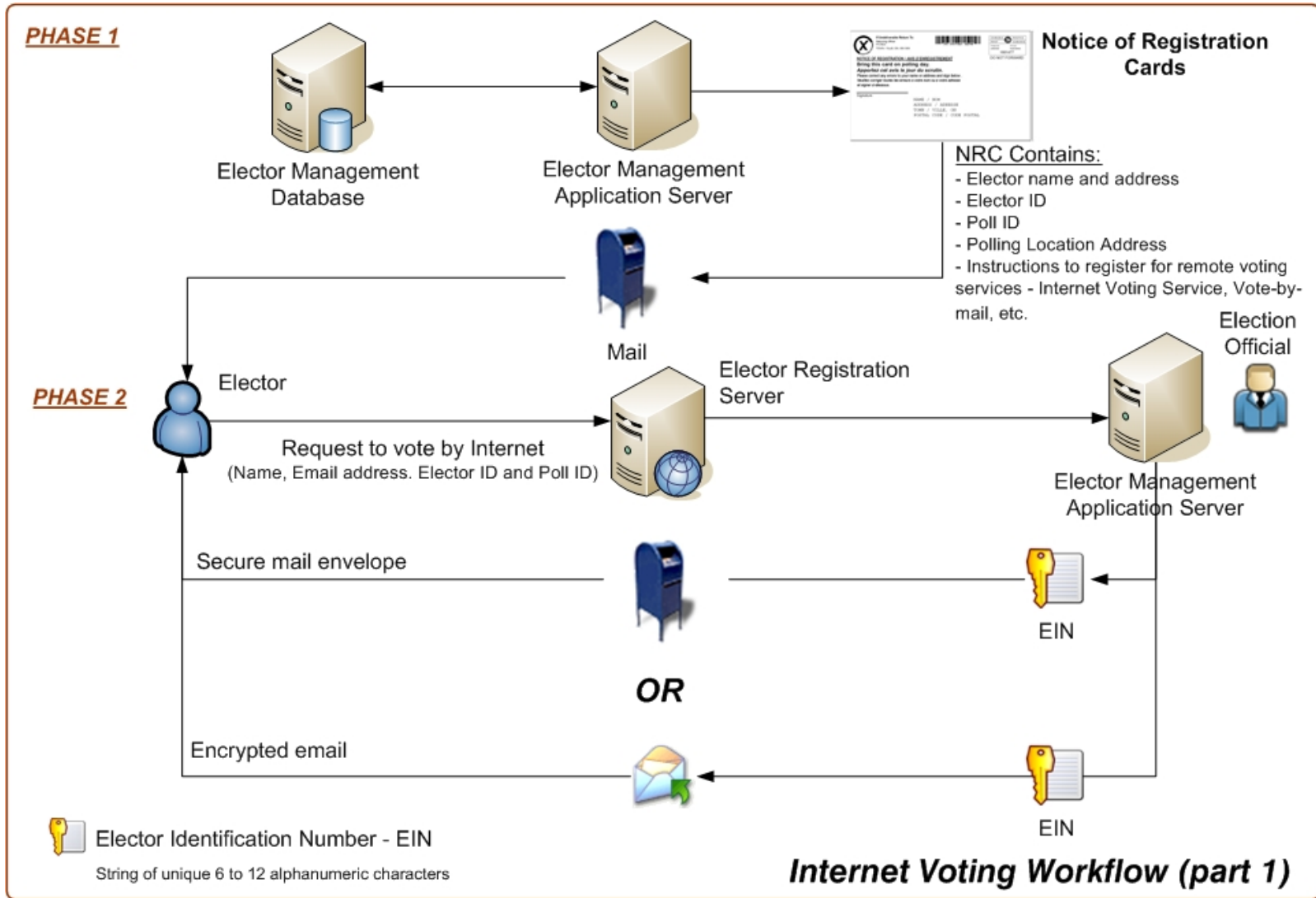
Remote voting

Maximize #
of voters,
not the # of
votes

- Internet Voting
 - Easy, quick & slick
 - Can not be used as the only voting channel
 - Very convenient for those who can use it
 - Can vote last minute
 - Browser independent
 - In Canada – City of Markham (2003, ES&S), City of Peterborough (2006, Dominion)
- Vote by Mail
 - Most accessible remote voting method
 - Voters mark traditional paper ballots
 - Centralized ballot tabulation

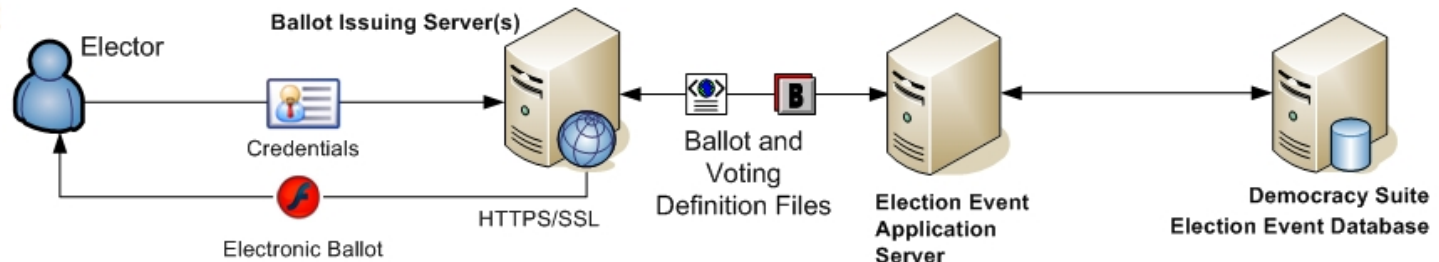


Electronic Remote Voting 1

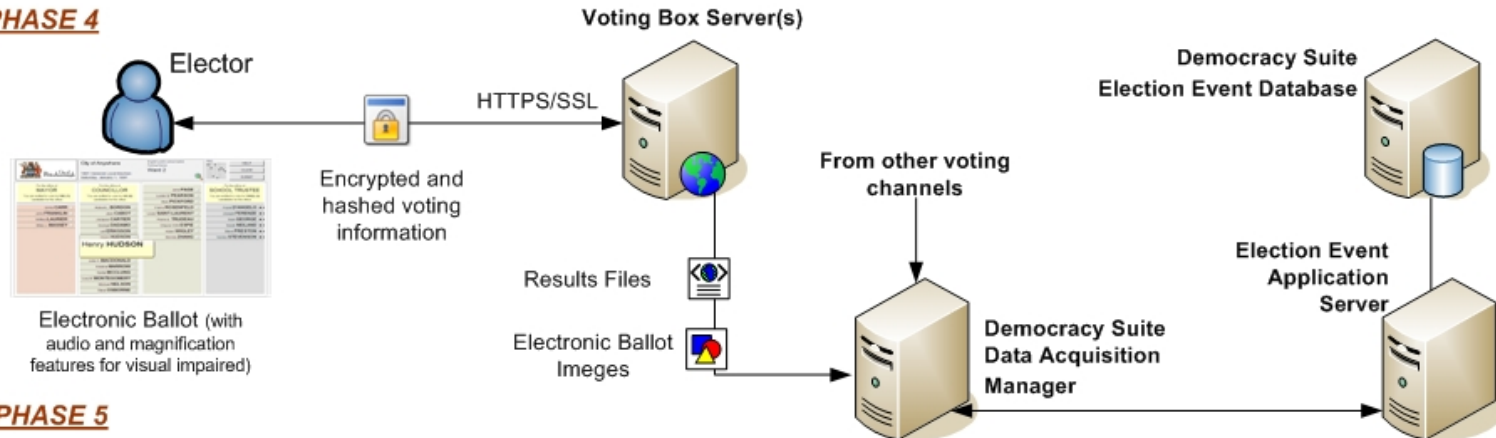


Electronic Remote Voting 2

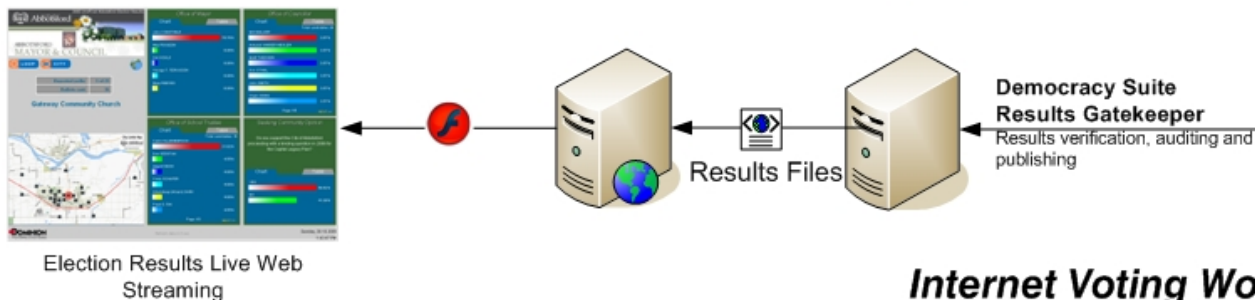
PHASE 3



PHASE 4



PHASE 5



Internet Voting Workflow (part 2)



Election Services Login


 If Undeliverable Return To:
Returning Officer
PO BOX 123
SOME CITY, ON X9X
0000798753 1681477

NOTICE OF REGISTRATION / AVIS D'ENGREGISTREMENT

Bring this card on polling day.
Apportez cet avis le jour du scrutin.
Please correct any errors to your name or address and sign below.
Veillez corriger toutes les erreurs a votre nom ou a votre adresse et signer ci-dessous.

ABRAMS MARY SUSAN LUCAN
430 HOWDEN ST

NRC Card

 **City of Peterborough**
2006 General Local Election
On Line Services - Elector Login

dominion VOTING™

Please type in your personal information to access Election Online Services

Enter Elector ID from your Notice of registration card (NRC) * ?

Last name * ?

First name * ?

Middle name ?

If you can't read the code, **generate** a new one.

Enter the security code shown above * ?


256134

Fields required for successfull login are marked with *.

For more detailed instructions, download **Quick Start Guide** (PDF)
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Internet Voting Registration



**City of Peterborough
2006 General Local Election**

On Line Services - Elector Services

dominion VOTING™


Welcome, John Smith

Please select a voting method

☐ Vote over the Internet

☐ Vote in person (see your polling locations)

For more detailed instructions, download [Quick Start Guide](#) (PDF)
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If Undeliverable Return To:
Returning Officer
PO BOX 123
SOME CITY, ON X9X


0000798753

1681477

NOTICE OF REGISTRATION / AVIS D'ENGREGISTREMENT

Bring this card on polling day.
Apportez cet avis le jour du scrutin.
Please correct any errors to your name or address and sign below.
Veillez corriger toutes les erreurs a votre nom ou a votre adresse et signer ci-dessous.

ABRAMS MARY SUSAN LUCAN
430 HOWDEN ST



**City of Peterborough
2006 General Local Election**

On Line Services - Internet Registration

dominion VOTING™

Welcome, John Smith (Elector ID: 0000195167)

Please type in your address as printed on your Notice Of Registration card (NRC)

Street number * ?

Street name * ?

Direction * ?

Unit type / number * ?

Please type in additional information

Year of birth * ?

Please select Personal Identification Number (PIN) delivery method

☐ Regular Mail

☐ Electronic mail

Enter e-mail ?

Confirm e-mail ?

Please select ballot type

☐ I prefer a regular ballot.

☐ I prefer a ballot for the visually impaired which supports text magnification and audible candidate names.

If your application to vote by Internet is approved, you will receive a PIN. You will then need this PIN to view an electronic ballot

Fields required for successfull login are marked with *.

For more detailed instructions, download [Quick Start Guide](#) (PDF)
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Internet Voting Login



City of Peterborough 2006 General Local Election

On Line Services - Internet voting login

dominion

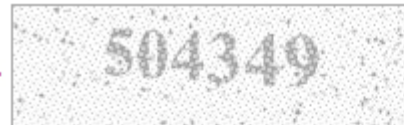
VOTING

Please type in your personal information to access and cast Internet ballot

Enter Elector ID from your Notice of registration card (NRC) * ?

Enter your Personal Identification Number (PIN) * ?

If you can't read the security code, **generate** a new one.



Enter the security code shown above * ?

Fields required for successfull login are marked with *.


Reset

Submit

For more detailed instructions, download [Quick Start Guide](#) (PDF)
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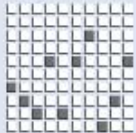


Electronic Ballot 1



City of Peterborough

English Public
Polling District:
District 1

RBID:


for the office of
City Councillor

You are entitled to vote for 6 candidate(s) for this office.

Robert L. BORDON <input type="checkbox"/>	John PAGE <input type="checkbox"/>
Henry HUDSON <input type="checkbox"/>	Lester B. PEARSON <input checked="" type="checkbox"/>
Jean CABOT <input checked="" type="checkbox"/>	Mary PICKFORD <input type="checkbox"/>
Jacques CARTIER <input type="checkbox"/>	Fanny ROSENFELD <input type="checkbox"/>
George DADAMO <input type="checkbox"/>	Louis SAINT-LAURENT <input type="checkbox"/>
Leif ERIKSSON <input type="checkbox"/>	Pierre E. TRUDEAU <input checked="" type="checkbox"/>
Jake JOLIET <input type="checkbox"/>	Clause VON ESPIE <input checked="" type="checkbox"/>
William L.M. KING <input checked="" type="checkbox"/>	Adam WIGLEY <input type="checkbox"/>
Elliot LAWSON <input type="checkbox"/>	Bonny ZHANG <input type="checkbox"/>
John A. MACDONALD <input type="checkbox"/>	
Kristine MAROW <input type="checkbox"/>	
Nellie MCCLUNG <input checked="" type="checkbox"/>	
Lucy M. MONTGOMERY <input type="checkbox"/>	
Micheal NELSON <input type="checkbox"/>	
Steve OSBORNE <input type="checkbox"/>	

Step 2 of 3

HELP


CLEAR

PREVIOUS

NEXT

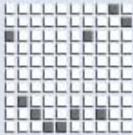


Electronic Ballot 2



City of Peterborough

English Public
Polling District:
District 1



RBID:

for the office of
City Councillor

You are entitled to vote for 6 candidate(s) for this office.

Robert L. BORDON <input checked="" type="checkbox"/>	John PAGE <input type="checkbox"/>
Henry HUDSON <input type="checkbox"/>	Lester B. PEARSON <input type="checkbox"/>
Jean CABOT <input type="checkbox"/>	Mary PICKFORD <input type="checkbox"/>
Jacques CARTIER <input type="checkbox"/>	Fanny ROSENFELD <input type="checkbox"/>
George DADAMO <input type="checkbox"/>	Louis SAINT-LAURENT <input type="checkbox"/>
Leif ERIKSSON <input type="checkbox"/>	Pierre E. TRUDEAU <input type="checkbox"/>
Jake JOLIET <input type="checkbox"/>	Clause VON ESPIE <input checked="" type="checkbox"/>
William L.M. KING <input checked="" type="checkbox"/>	
Elliot LAWSON <input type="checkbox"/>	
John A. MACDONALD <input type="checkbox"/>	
Kristine MAROW <input type="checkbox"/>	
Nellie MCCLUNG <input type="checkbox"/>	
Lucy M. MONTGOMERY <input type="checkbox"/>	
Micheal NELSON <input checked="" type="checkbox"/>	
Steve OSBORNE <input type="checkbox"/>	

Clause VON ESPIE

Step 2 of 3

HELP

CLEAR

PREVIOUS

NEXT




Electronic Ballot 3

Information			
Office of City Councillor, vote for 6 you have UNDERVOTED (4) Office of School Trustee (EP), vote for 3 you have OVERVOTED (5)			
Are you certain you wish to cast this ballot?			
<input type="button" value="Yes"/>		<input type="button" value="No"/>	
	UNDERVOTE	OVERVOTE	
for the office of Mayor You have selected :	for the office of City Councillor You have selected :	for the office of School Trustee (EP) You have selected :	
<hr/> John FRANKLIN	<hr/> Jean CABOT Lester B. PEARSON Pierre E. TRUDEAU Clause VON ESPIE	<hr/> Samuel DE CHAMPLAIN James COOK Patricia COSTER Jeanne MANCE Menelaus P O'DANIEL	



Electronic Ballot Becomes Paper Ballot

 **Ward 1**
English-Language
Public School Board

CITY OF ANYWHERE
1891 General Local Election
Saturday, January 1, 1891

DRO

To vote, fill in the box ☐ next to your choice(s), like this: ☒ Use only the marking pen provided.

Office Of Vote for no more than ONE (1)	Office Of Vote for no more than SIX (6)	Office Of Vote for no more than THREE (3)
Emily CARR <input checked="" type="checkbox"/>	Robert L. BORDON <input checked="" type="checkbox"/>	Samuel de CHAMPLAIN <input checked="" type="checkbox"/>
John FRANKLIN <input type="checkbox"/>	Jean CABOT <input type="checkbox"/>	James COOK <input type="checkbox"/>
Wilfrid LAURIER <input type="checkbox"/>	Jacques CARTIER <input type="checkbox"/>	Patricia COSTER <input checked="" type="checkbox"/>
Miles J. MASSEY <input checked="" type="checkbox"/>	George DADAMO <input type="checkbox"/>	Jeanne MANCE <input type="checkbox"/>
	Leif ERIKSSON <input checked="" type="checkbox"/>	Menelaus P. O'DANIEL <input checked="" type="checkbox"/>
	Henry HUDSON <input type="checkbox"/>	
	Jake JOLIET <input type="checkbox"/>	
	William L.M. KING <input checked="" type="checkbox"/>	
	Elliott LAWSON <input type="checkbox"/>	
	John A. MacDONALD <input type="checkbox"/>	
	Kristine MARROW <input type="checkbox"/>	
	Nellie McCLUNG <input checked="" type="checkbox"/>	
	Lucy M. MONTGOMERY <input type="checkbox"/>	
	Michael NELSON <input type="checkbox"/>	
	Steve OSBORNE <input checked="" type="checkbox"/>	
	John PAGE <input type="checkbox"/>	
	Lester B. PEARSON <input checked="" type="checkbox"/>	
	Mary PICKFORD <input type="checkbox"/>	
	Fanny ROSENFELD <input type="checkbox"/>	
	Louis SAINT-LAURENT <input checked="" type="checkbox"/>	
	Pierre E. TRUDEAU <input type="checkbox"/>	
	Clause VON ESPIE <input type="checkbox"/>	
	Adam WIGLEY <input type="checkbox"/>	
	Bonnie ZHANG <input checked="" type="checkbox"/>	

- Recreate cast ballot at the back-end
- Every electronic ballot -> paper ballot
- Used for auditing
- Ballot can be printed, scanned and tabulated as any paper ballot
- Permanent record



Current Work - Canadian and US Elections

- Development of new poll-level optical tabulator – CF201
- US Certification
- HAVA compliance
- New release of EEMS – Election Event Management System – for US
- Further development on rich-client Internet ballot with data hiding techniques
- Support for smart cards for remote voting
- Further integration of GIS into Elector Management system



dominion

VOTING



Election Workflow Automation

Goran Obradovic
Director of System Architecture
Dominion Voting Systems Corp.
www.dominionvoting.com
e-Voting Workshop 2006
August 2nd to 4th, 2006

